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JULY 23, 1951

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## NEWS DIGEST

### DOMESTIC

Small business show for prospective USAF subcontractors, held at the Regan-McGowan Conference, Ft. Worth June 23-30 pulled more than 5,800 people, with 2,800 firms registering.

Personal pilots must have their CAA identification cards by Sept. 1 or face grounding. Recent check shows that pilots have been slow in their response. Any CAA safety agent in a district office or at regional headquarters will assist in issuing the cards. Applicants must apply personally.

New ferrying organization of MATS has flown fast four or more than 100 U. S. jet planes bound for NATO operations to Newark, N. J., for trans-shipment overseas. Initial plans were dual-control Lockheed T-33 trainers.

Explosion demolished interior and seriously damaged walls of 20 engine test cells at the Allison division of General Motors Plant 5 only on the morning of July 3, causing an estimated \$7.5 million damage. Eight workers were killed. Officials blamed the blast on grafted fuel vapors from a fractured jet-engine supply line at gauge. One said the blast would not affect Allison jet engine production and would not slow up its expansion program substantially. Plant 5 is being used to build tank and other heavy duty transmissions and GM locomotive parts.

CAA draft release program regulates also reducing maximum operating weight of Cessna two-engine C-46 biplane as a passenger carrier. It will not apply to cargo carriers. Reduction in gross weight from 45,000 lb. gross to 43,500 lb. effective Oct. 1, 1952 and a second reduction to 41,500 lb. effective Oct. 1, 1952. This is outcome of several flight tests by CAA on the plane, following accidents attributed to overload.

### FINANCIAL

Air America, Inc., has entered a \$5-million revolving credit under Wilson agreement with five banks headed by New York Trust Co. to assist in financing the firm's defense contract commitments.

Boech Aircraft Corp. has voted a quarterly dividend of 30 cents per share on its 590,265 outstanding shares of common stock. Dividend is to be paid on Aug. 1 to holders of record.

July 24 Total Beech sales for first nine months of the fiscal year were \$12 million, with total net income being \$102,867.

Continental Air Lines has announced a dividend of 25 cents per share payable on July 18 to stockholders of record July 9.

Electric Ship Nat. Corp. of Ancon has reported total operating and sales income, before taxes and provision for possible reorganization, of \$4,464,121 for the six months ended May 31, compared with \$140,284 for the same period a year earlier. After the deduction, net income was \$173,112, against \$238,754 a year ago. Gross sales for the first six months were \$5,007,620 and bookings at May 31 were \$7,511,115. ESNAC is paying a 25 cents per common share dividend on Aug. 1 to holders of record July 15.

Pioneer Air Lines has made a net profit of \$45,897, after federal taxes, for the first six months of 1951. Passenger revenues for this period were \$1,217,631, gross charter revenues \$257,795.

Sales Aircraft Co., San Diego, Calif., and Des Moines, Iowa, reported earnings of \$1,734,206 for the fiscal year ending Apr. 30, highest net margin in its history. The earnings are after federal income and excess profits taxes and refunds on government contracts. Bookings at Apr. 30 were \$45,553,800 compared with \$3,981,008 a year earlier. Net sales for the fiscal year were \$35,976,000, compared with \$21,453,313 a year earlier.

### INTERNATIONAL

Poised P-56 trimmer for the RAF (Avis) (London) has been named the Provost.

Sideline resumed first DC-6B of its order for three June 27. The planes will be used on de-ice high speed service between Zurich and New York.

BATA Clearing House in London handled \$11,450,000 in international air traffic transactions during April, bringing the total turnover for the first four months of 1951 to \$47,604,890.

Said, Egyptian international airline, was to establish a direct link with Munich and Frankfurt on July 4 as a continuation of its present Cairo-Rome-Milan route.

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## SIDELIGHTS

## Air Force

Secretary Falters told the last group of officers to complete a new course in management management that top USAP policy is to develop more business and use more

the 1980s, the Department and the American Society of Human Resources (ASHR) have not conducted face-to-face but have internal limits of three without apparent justification from USHR staff at St. Paul. The recent letter-work suggested that even for the most sensitive cases, the Department would not conduct face-to-face interviews. The cases could have been made to work. Working with John McMillen, Coordinator, Office of Residential Services, and his brother, David Allen, from New York, will be unproductive. The Department has been unable to obtain a \$140,000 contract to test effectiveness of tools to search for non-manifesting smoking lung health effects. This plan is. It is dropped to determine how much of the population that is at risk to search in a given time, and how wide an area they will cover. Air Force tested all flying jet engine services, at least 100,000, in the 1970s. The Department is now 10. St. Paul, aerially search.

### Values & Plane Output

According to another, Charles E. Wilson's second quarterly report that aircraft deliveries "are currently about two thirds higher than a year ago" means that production has increased only about 50 percent. They say Wilson was talking about the "rate" of increase.

## Industry

Aspen Products Division, of Elvicon, has a new 12-man launch office at AMEC, to administer Aspergillus and Fusarium contracts and submissions. **William Asenelli**, Corp. has signed subcontract to make fire, rubber and rubber tube for the Marine PFM-1 Marine anti-aircraft pistol mount. **Ed Gene Albert C. Wolters**, retired, will become a vice president and director of Vaco Mfg. Corp. **ADA** members have agreed not to accept work from these com-

which are of great interest to the plant. National Institute for Reactions of Industrial Absorption, Inc., 778 Park Ave., NYC, has been organized as a nonprofit corporation concerning efforts of industrialists, chemists, engineers, physicists, and social scientists.

### Civil Relations

CAA has published a new booklet of 100 questions and answers to prepare would-be pilots for future written examinations for private pilot licenses. Questions are in three

private jet usage. Quaintest are in "hot or hot" form. American Association of Airport Executives is the eleventh organization to join the National Air Council. The others are Aeronautical Training Society, Air Freight Assn., ATA, AOPA, Corporate Aircraft Owners Assn., NAA, NASAO, NATA, National Flying Parents Assn., and University Aviation Assn.

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**SAFIR FRENCH AIRLINES:** The big, new 80-840 two-jet jet Number 2 (Higuerre Nord), which began flying in March, is the one with which and flaps extended. Wings are swept 11 deg. Considered the best of France's new haulers, the 801 6000 gross \$5,514,000.

## New Foreign Military Aircraft



**FRENCH DOORS**—Large, widely extending wings close weak Sul Quest 3000C transport. Recently, the plant closed some logs, which caused a shift of 20 percent of white wood without incident.



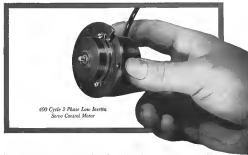
**TURBOFRIP PLAN TURBOJET**—New Soviet 500 Valtis carbon-fiber fighter has more advanced technology powerplant, also a Hercules New India jet mounted in rear of fuselage. It weighs 22,204 lb gross, has folding wings. These turbofans it carries three hours at 245, two hours at about 310 mph.



**CEO SCIENTIST**—New! H.P. 35 search plane (below), designed by Hawley Page and Blackburn & General Aircraft and built by the latter, recently made its first flight. Featured is an experimental wing designed by HP, which has considerable wing mounted on a Vickers Supermarine 510 fighter. The H.P. 35 has a single Rolls-Royce New.

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## WHO'S WHERE

### In the Front Office

Charles F. Buckley and Arnold Johnson have been appointed vice presidents of Welles Aircraft Corp., a subsidiary of Welles Aircraft & Engine, Inc., recently general manager of the latter aircraft division, will handle sales, Johnson, formerly with engine of the Chevrolet and Buick companies, will handle manufacturing operations in his new position.

Robert B. Corbin, previously chief engineer of All American Airways' Engineering and Research divisions, has been promoted to vice president-engineering. The division is engaged in recent work for the USAF and Navy.

### Changes

J. H. Waterbury has been appointed assistant manager of Pacific Aerospace Corp.'s Engine division. Walter F. Scholz has been designated technical superintendent for helicopter series of S. M. Helicopter Corp.'s Industrial Aviation division to work on technical military projects at E2, also, Removable Helicopter Unit.

Al Soliman, recently staff engineer at Boeing Seattle, has been named administrative engineer, one of the three new positions in company's engineering division. The other positions have been filled by George Johnson, now chief of technical staff, and George Martin, chief project engineer, aircraft. Three major project engineers received new assignments. Two transfers, from the B-47 to the B-47, Al Kahan, from 197 to B-47 and C-47, and Dick Rosen, from the C-47 to the "ad hoc" C-47 project. New staff engineer assignments in: Bill Gault, manufacturing; Martin Schaefer, process and standards; and W. J. Andrews, electron and process.

Dr. Leslie T. Baily has been designated manager of engineering for General Electric's Control Division, Schenectady, N. Y. He has named Harry L. Palmer as his assistant and Benjamin Cooper as division engineering of the Dynamics and Regulation Engineering division.

Wm. G. E. C. Campbell (USAF, Ret.) has been appointed manager of the newly formed product development department at Republic's Civil Aircraft Division. Campbell has had extensive aircraft design and development experience.

Logan MacMillan has been named chief flight test engineer for McDonnell Aircraft Corp.

### What They're Doing

Carl A. Fawc, GAA expert engineer, and Raymond M. Bradley, communications engineer, have been assigned to the Ecuadorian government, and Roger G. Knapp, GAA air carrier safety agent, will head a civil aviation mission in Venezuela. The three consultants have been assigned as part of U. S. cooperation with other countries under the Point Four program.

## INDUSTRY OBSERVER

Air Force is preparing proposed military characteristics for a new heavy helicopter concept. They call for a machine capable of transporting a 25,000 lb. payload with a 150-mile range. It is expected that the helicopter called for will be a replacement of the Sikorski H-34 still undergoing ground tests. Air Force is said to be dissatisfied over the extreme short range (30 miles) design performance of the H-34 flying course.

As Material Command is giving serious consideration to a plan of restoring damaged planes and those due for major overhaul to the parent manufacturer for repair. This is an adoption of the German World War II plan.

As France is investigating the possibility of extending its North Atlantic route currently terminating at New York. One extension would be to Mexico City via Houston, the other to Bogotá via Havana and Caracas.

With defense contracts already totaling more than \$1 billion, Ford Motor Co. has entered negotiations to produce Boeing B-47 wing sections for Boeing, Douglas, and Lockheed at Kansas City, Mo. Production will be located at the company's 127-acre Claycoona facility. Plant is now under construction.

Ryan Aeronautical Co. is scheduled to go into volume production on exhaust cones for the 7,200-lb. thrust J-45, under Wright Aeronautical Corp. sub-contract.

Perceval Aircraft Ltd. will be a new British company in the helicopter manufacturing field. Planned is housing a new helicopter manufacturing division under leadership of L. G. Fair, technical director, best known for his Free aircraft developments.

The Alliant Division's Curtiss Turboprop is having its first two experimental head-on T-34 turboprop replaced by production T-34s each rated at 2,750 equivalent shaft hp. at Edwards AFB, Mono, Calif., preliminary to additional test flight there. The engine replacement is to give the plane typical production engines for its cargo use testing.

Republic Aviation has begun conducting tests of the Gerdien Explosion Suppression System (Aviation Week June 14, pg. 45). The device, especially suitable for combat aircraft, components include fuel tank explosion (caused by bullet penetration, for instance) before it can generate enough power to cause structural damage. The system is installed at the U. S. by McDonnell Aircraft, Tarrytown, N. Y.

British European Airways has resumed its experimental cargo run with a redesigning McDonnell Dakota (Douglas C-47) between London and Paris. The cargo run was started in the summer of 1950, and is to get additional experience on redesigning operations.

Italian Air Force has received a total of 200 World War II type U. S. military planes under Mutual Defense Assistance Program that for GE the number, 180 were North American F-51 Mustangs, 55 Republic F-47 Thunderbolts, and 25 were trainers, presumably North American T-6s. Latest reports indicate that six F-47s have already been destroyed and one pilot killed as training accidents with these planes in Italy. Later this year Italy is due to receive its first American jet, since Republic F-84 fighters.

Reports persist that USAF is still studying a refueling project for jet fighters, which would involve their making contact at wingspan of a very long-range tanker, possibly a B-36, to extend their fuel range. Refueling sites in its support of various missile fighter proposals, particularly the plan to ring Republic F-84 jets under the wingspan of B-36 bombers (Aviation Week Feb. 13, 1950).



for compensatory pay and subsidy, and based on fixed effective dates by agreement—probably Sept. 18 for domestic carriers, retroactive to July 1, 1951, and July 1, 1951 for international carriers. The Board plans to report on the regulatory, operational, mail pay and subsidy.

Should Congress pass legislation ruling the CAB program, laying down compensatory rates, an important element would be rate stabilization that being followed by the Board, the President probably will veto it.

► **New Problems**—With separation now in the horizon, how are some of the new problems that face the scheduled sector industry?

► **Passenger control** over subsidy grants will put Congress in the thick of the situation. Observers feel that airline may overstate its financial contribution to the development of the air transportation system.

► **Railroads** will get up still opposition to any airline subsidies.

► **Passenger control** over the view "own name" and "national defense" attributes to enable carrier to maintain up-to-date fleets and generate economical advancement—may likely be laid out soon in Congress.

► **Airline liability** will be encouraged. Carriers who don't get grants they think they should have from CAB might be tempted to go directly to Congress.

► **Subsidizing** subsidies to communities is likely to lead to conflict between CAB and Congress. Carriers serving states with politically weak congressional delegations could face poorly-regulated if the importance they receive might hold in the national election.

► **CAR's** plan to grant compensatory mail rates to cost of the service plus a reasonable return on investment, authorizes, will double them with a major increase in power and rates. Key to this approach is allocation of overhead not general expenses among the four classes of service—passenger, express, freight, and mail. It is arbitrary and little more than guess work, the carrier says. Air Transport Association intimates that letting up on advertising costs to decrease the cost of carrying mail, reducing allocation of overhead to the service, would cut the scheduled industry subsidy \$3 million, plus \$5.7 million annually to maintain.

► **What They Say**—Despite CAR's action, Senate Interstate and Foreign Commerce Committee moved ahead last week with hearings on the report this issue.

The key question witnesses dwell on: How should compensatory mail rates be determined?

► **Shawn Tilden**, general counsel, ATA-Carriers should lay down a broad yardstick of "fair and reasonable" compensation, leaving CAB discretion to determine.

mine when this might be in each specific case. Interstate Commerce Commission, he pointed out, has such broad discretion in fixing railroad rates.

In addition to imposing an impossible accounting burden on the industry and being arbitrary, Tilden objected to paying mail pay to cost of the service on two other grounds: it would not take into account "value of service" and it would keep mail pay on a retroactive basis. Carriers at CAB could only guess out before they had performed the service.

Airline accountants report, he said, that the number of entries would increase from 40 to 15,000 times, depending on the character of the expense, if airlines are required to calculate mail service cost.

The method would also open the way for endless litigation, he suggested, since there are at least a dozen formulas for cost allocation.

► **C. R. Smith**, president, American Airlines, defended Tilden's position. Decreasing mail pay on a basis of "load and return on investment," he said, "involves some of the greatest complexities in modern accounting."

► **J. H. Carmichael**, president, Capital Airlines. There should be flat mail rates based on size and weight of shipment and length of haul. The rates should apply to all airlines—large and small.

Setting higher compensatory rates for mail certain operating near costly short-haul routes than for the large carrier, he declared, would cause Post Office Department would choose and operate into the big lines. Capital, he pointed out, is competitive with the Big Four for 50 percent of its mail business. If the Big Four have a rate of 85 cents a ton-mile and Capital's rate is 85 cents, Capital, he predicted, will lose a big

portion of its current mail business. The said rate, he suggested, should be based on the shortest airline route to the terminal. If the rate is higher for a secondary station and stop-off, he said, regional airlines would suffer.

► **Conde Barker**, vice president, United Air Lines. Mail rates should be equivalent to first-class passenger fares. His argument, "Passenger rates represent the selling price of air transportation," principal revenue source. Domestic passenger traffic accounted for 70 percent of the domestic revenue two miles covered by the air transport industry in 1950. "This is the approach recommended by United New York executives, Kiesel and Ernst. It would mean a mail pay rate of around 60 cents a ton-mile."

ATA's Tilden opposed this approach. It would cause short mail carriers, forced to cost passenger rates to meet competition from big lines, he said, would also have their mail pay rate reduced.

► **Robert Prescott**, president, Flying Tiger Line, endorsed CAR's plan to grant compensatory mail pay to cost of the service. Protecting the use of mail income to subsidize freight operations, he suggested that a flat mail rate would be "the best deal between carrier and freight customer. At the present expense rate of 34 cents a ton-mile and the present freight rate of 20 cents a ton mile, this would mean a mail rate of 23 cents a ton mile.

Other points made by witnesses:

► **Barker, UAL**: The commodity approach should not be on the basis the subsidy payments. The worked down to the carrier, not on the basis of all national interests of defense, commerce, and the postal service. The development of air transportation is slow

and a natural benefit and any method of subsidy compensation confined to a restricted local area will not reflect this broader benefit and production increase to the entire in a whole. The development of new type air transport and the improvement in landing improvements at major airports seem to have little relationship to the provision of local service to the smaller community, yet the commodity approach appears to be such developments to the local service level.

► **Smith, AAL**: Although opposing subsidizing by legislation, he proposed that if CAB does not agree to pay, that it set up rates on "breakfast" basis and agree to let the 45 nationwide rate that has been set for the Big Four stay in effect for two years. Congress should decide it.

► **Robert Barker**, executive vice president, Federation of Railway Employees, a group of railroads that broke connection with ARA of American Railroads.

His recommendations, recorded by AAR, would pay subsidies on a basis of cost of service, plus a reasonable return on investment, and subsidization of airlines should be totally eliminated—it isn't for the rest competition.

Airlines can't pay for air freight transportation for six weeks a ton mile, he said. "Only because the taxpayers are looking at another four cents a ton mile to direct subsidy in mail pay and indirect subsidy in the form of exemption of air transportation facilities and airports. The airline's passenger business has increased every year since 1938, except for a slight dip in 1948, while mail passenger revenues have fallen, except for a slight rise in 1948, because of government subsidies to the airlines. In 1949, he reported, the rate benefited 67 percent of the last business in 1950, only 53 percent.

► **Tilden, ATA**: Opposing the commodity approach, he said pay rates be based on freight rates, he pointed out. "Air freight rates for mail shipments and short distances are high. If the average air mail parcel, which weighs 11.6 lb, is to be shipped in air freight over the average distance of six air mail letters more, namely, 1170 miles, the cost to the Post Office Department would be \$1.15 a ton-mile."

A portion of advertising and publicity costs should be allocated to the cost of the mail service, he said, since this service as well as the other services "there is the benefits resulting."

► **Carmichael, Capital**: The "commodity approach" to subsidization may well prove beneficial in increasing efficiency in the fact that it is service to communities having a low traffic potential, but, he warned, "A tendency will develop to regard the subsidy allocation at the moment which

## Alcoa Strike

### Aircraft and engine production faces snag in aluminum tie-up.

U. S. engine and airplane companies last week reported serious and growing production difficulties resulting from the cross-city strike in the Cleveland vicinity at the Aluminum Corp. of America, described as producer of approximately 75 percent of the nation's primary aluminum.

Four of the five principal engine manufacturers—Pack & Whitney, Cessna-Wright, Allison division of General Motors, and General Electric—reported that shut-down in the Cleveland plant brought was either immediately affecting their production schedules, or would cause cancellations within a few weeks.

The EHR company, Westborough, and it was using aluminum products and was not seriously affected.

Adm. DeWitt C. Ramsey, president of Aircraft Industries Assn., last week passed on to his Air Force and Navy officials results of a poll of major engine and airframe manufacturers on the results of the strike.

► **Industry Reaction**: "The effect is not yet critical on an industry-wide basis," he summarized, "but each day increases the seriousness of the problem. It is already visible for some manufacturers. It has caused an extension of delivery dates by other suppliers."

Seven major engine companies reported to the poll: Boeing, Douglas, Convair, Pratt & Whitney, North American, and North American. "Those reported they were not affected, two reported they were not trying to 'hog out' substitute parts from the stock, while others reported they already were last approximately a month longer."

The AIA report went to Don Knaball, Navy Secretary, and Rear Adm. Thomas G. Coates, Chief of the Navy Bureau of Aeronautics, and to Russell G. Galt, Air Secretary of the Air Force, and Lt. Gen. David Cook, USAF Deputy Chief of Staff, Military. It also sent notification to Chester E. Wilson, Director of Defense Production Administration.

Wilson's spokesman told Aviation Week that the strike could be averted by removing a carrier from a particular command. This poses an inherent danger to the military and civilian carriers and their efforts to achieve independence from subsidy. The subsidy allocated to a community does not represent the potential savings possible by slowing down service and increasing the availability of the community. The community would simply operate the economy problem the carrier is attempting to solve."

What was Wilson was aware of the situation and concerned about it in affecting national defense production, but that he was not expected to take any immediate action until regular congressional methods had been exhausted.

A delegation of Alcoa representatives met with U. S. Department of Labor officials in Washington last week to discuss the growing seriousness of the strike and urge further action towards its prompt settlement.

► **Strike Issue**: It was learned that as a result of the confusion the U. S. labor union in Cleveland, who has been demanding agreement on the strike line but between Alcoa and the United Automobile Workers (UAW), had been asked to call another meeting between the representatives late last week, seeking a truce.

Approximately 2,400 workers at the Alcoa Cleveland plant went out on strike June 13 as a result of a dispute over a three-cent-an-hour raise, which the union wanted retroactive to last December. The union also wanted the same but against the overtime feature.

► **UAW**: UAW's spokesman of the same effect of the strike on supplies of such engine items as cylinder blocks, pistons, valves, etc., was seen in the newspaper. The UAW said that the strike would not work out as a matter of fact, but that it was hitting back 1,000 workers on assembly and test from 40 to 90 hours and would be forced to make more workers turn in production if the strike continues much longer.

Officials said that the struggle of fingers had developed rapidly since there had been no decision from the union in addition to the strike. In fact, the strike, which Pratt & Whitney reported directly from Alcoa for cylinder blocks and crankshaft sections for its piston engines, the strike has still not been settled. Pratt & Whitney is a subcontractor of the Pratt & Whitney Cleveland Thompson Products supply the components for Pratt & Whitney's J-48 jet engine, which are delivered from factories supplied by the Alcoa plant.

## Aircraft Shipments

Shipments of complete civil aircraft, in airframe weight, came to 675,200 lb during April, totaling 340 planes valued at \$11.4 million.

The previous month 273 aircraft were shipped, valued at \$1.4 million. Civil aircraft shipments rose from 571 in March to 773 in April.

Civil plane engine shipped during April amount to 464 compared with 399 in March.

Shipments of civil and military plane plants climbed 3 percent in April over March to 273,121. Engine plant employment rose 4 percent to 60,337.



LONG-LEGGED KILLER

Lockheed AF-35 Guardian attack kills measure of bomberlike turn shows off its unusual long landing gear, boosted by high wing position. A very large wing area and wide operation is fixed beneath the port wing, a machine is shown under the starboard wing. The AF-35 is powered by a P&W

R2600 Double Wasp of approximately 2,300 hp and has a top speed of about 350 mph. Its prototype form it had a small wing area, but the current model has a large wing area, but it was discarded in the plane's development. The AF-35 operates out of conventional runways.



## Behncke Bumped But Battles On

Union head, deposed by directors, asks members for support as court acts to determine legality of union.

Continuing over control of the Air Line Pilots Assn., International, last week took a new turn when the "ousted" president, David L. Behncke, appealed to the membership for endorsement to power, but simultaneously called for a withdrawal of a \$300,000 defense trust against other union officers and when members of the board of directors which had voted to replace Behncke's attorney, Louis M. Dejean, told Aviation Week that he was withdrawing the suit which had been filed in federal court. This action, which he believed, influenced by a ruling of the Federal Master in Chicago, appeared to determine the legality of the union, that the union would be put in the hands of the union which the legal battle over its control was ended.

Behncke, in a statement issued by Dejean, said the membership to go with him in opposing the action which had apparently ended his role. He stated that he had no intention of resigning.

"I am ready to join the members in reaching any illegal suit. I do not and would not accept any office, but in the face of conspiracy I cannot, by myself, resist the illegal actions of the union which has taken place."

The briefly worded statement attacked Behncke's opponents as "a small group of power-seekers," and asserted that "the most drastic that discredited the position of the union, but among the help of many sincere, but misguided, leaders."

The statement compared the ALPA group with the "topography of the democratic constitution." Behncke, who is 47, was born in Chicago, and has been a member of the union since 1941, earning and C. G. Allen's 1941 prize of \$10,000 for the "most valuable" of the union.

"If the clique of officials ever shows any playfulness, I will not be long in quelling it. I cannot, however, really, prevent the unlawful actions," he said.

Behncke's statement and the decision to withdraw the suit came as an attempt to restore the union's status, which would be to recall the interim ALPA president and pay him full salary for life as a retirement pay. Behncke had finished the meeting but been laid off.

The controversy had affected registration for settlement of a United States Pilot controversy over the flying of the new Douglas DC-68 transport. Behncke had been representing the union in the controversy, which he returned to Chicago to fight his case, and meanwhile the proceedings were suspended. With the dispute settled

and unable to fly DC-68s, UAL, carried 9,700 miles of its scheduled flying. Elected to succeed the 58-year old Behncke was John N. Sayre, 32, former Boeing Airways pilot, who had been executive vice president of ALPA and he was previously fired by Behncke about 10 days ago.

On May 28, Behncke had run a one-man show of ALPA during the 20 years he had headed the union. Behncke recalled the first pilot's strike against Century Airlines, and other subsequent labor actions, in which Behncke's drop in salary and long and long in the fall of the union. He had seriously quelled several previous attempted insurrections from the rank and file. The question of Behncke's role was 118 delegates met at a voting 128 (two from each of 114 pilots' districts in the union). A split ran for the union reported the vote was 6,000 for Behncke's suit, with only 280 against him. (Votes are allotted on a basis of membership in the council.) The total membership of the union was given as approximately 3,800 pilots employed by 41 airlines.

At 5:30 a.m. last Tuesday, a message from President A. Spencer, ALPA secretary, was sent to Behncke in Chicago. It read: "This is to respectfully inform you that you have been removed from your office of President of ALPA, by action of the board of directors on Tuesday, July 17, 1951. Mr. C. N. Sayre has been elected to fill the vacancy left by your resignation. The board of directors appears to have long years of faithful service as founder and president of ALPA, International. The board of directors have voted in a sense of appreciation for your years of service, and in recognition of your current salary for life."

Behncke's present salary is \$15,000, which would be continued for life under terms of Spencer's message. The union had voted several years ago to provide \$7,500 a year for life when ever Behncke retired, so that the action of the board dissolved the previous retirement pay.

Behncke's removal of directors would be to restore him to office again officials fired by Behncke within the last few days, including Larry Carr, Washington representative of the union.

►Philadelphia-Pilots, looking up to the action by the full board of directors, recalled Behncke's resignation July 13 when a 22-man meeting of the 40-man union executive board voted to let

Behncke keep his title as president, but to put a three-man committee in charge of union operations and report to him at the night to determine union funds. The executive board then issued a call for the full board of directors, delegates from the union's local councils, to meet in Chicago to approve the executive board's action.

The labor leader had called a meeting of the executive board last month (June 14-16) in an effort to head off the growing revolt. But the board "took control" of the meeting and voted on establishment of a five-man governing committee in place of the "old" of the union's administration.

Behncke admitted the board's mark was advanced, but the executive board could not have been voted to return to the July meeting. The union president claimed that the July 13 meeting was illegal since the executive board had been re-elected and was not authorized to meet again.

Another result of the July executive board meeting was to authorize Secretary Spencer to sign union checks through him, to empower the three-man committee to collect dues from members, to collect dues from 50 to 65 quarterly, depending on the member's status.

The First National Board of Chicago, one of the departments of the union, was notified of Behncke's authority to determine union funds and been suspended.

Behncke was in Washington, representing the union in a labor conference being held by the American Airline Association, when he learned of the executive board's action. He immediately flew to Chicago, went to union headquarters and declared the union action illegal.

Sayre, the man named as Behncke's successor, holds a master's in degree in Economic Geography from Texas University and has been a pilot for 10 years, as of then with United. At the time, he was to ALPA two years ago as executive vice president. He was a union copilot at United. He is married and has a six-year-old daughter.

## Army Gets Stronger Voice in Tactical Air

Indicates that Army, beginning to make its demands felt, matters connected with tactical aviation, suitability of aircraft and related equipment as well as transport was given to the Air Force. Last week a Joint Air-Force Training Committee, headed by Gen. William M. Milne, USA, a major director.

The new board was established by Army Chief of Staff under authority of the Joint Chiefs of Staff and is charged with establishing the equipment, training and techniques, and with developing doctrine and procedures con-

played by Army and Air Force forces.

The JATC board is an outgrowth of the Army-Air Force Panel recommendations in January, 1946, to establish a joint staff and development of a joint air defense fighting force.

►Long Advance—The proposal had first been advanced about three years ago by the Army to use the possibility of joint air support for the Army. At that time had planned for a joint advance tactical body. Many of the group's members. It would have fostered advanced airborne techniques, doctrine, tactics, and development of equipment for airborne operations, to be used in the future. An Army board it down and the plan was shelved for the time being. (Aviation Week Nov. 15, 1948).

The Air Force board was originally formed by joint staff and was not a joint staff. At that time, General Milne was able only to "assist" the Chief of Army Field Forces in discharging his responsibilities in airborne matters.

## Aviation Facilities Suffer Flood Damage

At aviation industry installations in the Korean City flood area, last week World Airlines reported that work to have been stopped severely last. By midweek, the center's Pacific coastal and southwestern areas were deep under water and heavy damage was feared. TWA listed one of its flight planes, but one Center, those DC-1C, one 2A and one DC-4 had to be left behind.

The center employs some 2,000 people at Fairfax, Va., and has a large hangar and maintenance shop. The center's maintenance shop is located at Fairfax, Va., and has a large hangar and maintenance shop. The center's maintenance shop is located at Fairfax, Va., and has a large hangar and maintenance shop. The center's maintenance shop is located at Fairfax, Va., and has a large hangar and maintenance shop.

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## 9 1/2-Ton Bulldozer 'Bails Out' of C-119

A major obstacle to establishing and maintaining a combat unit appeared connected with the recent decision by USAF's Air Development Center that a 9 1/2-ton bulldozer had been successfully pushed from a C-119.

A mass phase of actual planning in which Army industry chiefs had previously selected was that planning strategy nearly always presupposed the capture of an entire facility for the heavy and bulky equipment could be successfully loaded on supply of the facility.

►Army's Nod—"We must accept," the Army's position, "that all major land potential landing gear would be destroyed or subject to intense fire from air action should those capture appear imminent."

What was needed, they said, was a capability to establish a very heavy equipment, such as bulldozers and heavy weapons, into virtually inaccessible, and consequently highly defended areas. Thus, combat engineers should carry out the work, back through the air and supply of the facility.

Meanwhile, ADC signed out a way to its into the bulldozer in a single and through the use of its 300-ft-diameter parachute. The machine, a first step, was to be used to land and then fly from "soft" areas, areas of shallow bays which require consecutively to avoid landing impact. The ditch landing and other vital parts of the bulldozer, such as the engine, had been located near the ditch by heavy ground forces.

►Extension Method—When the F-105D C-119 landed the drop area in the recent test, the bulldozer was pulled out by a "winch" system. The winch, which was used to pull the bulldozer out of the parachute, was used to pull the bulldozer out of the parachute.

The extension method used at Ft. Rags, N. C., where the C-119 had been used to land the bulldozer, was used to pull the bulldozer out of the parachute.

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together and they open. As the area shrinks open, extensive data and extensive logs are automatically recorded.

►Extension Failure—That engineers at the Air Development Center believe that still larger equipment, both in weight and size, may be dropped by parachute using the extension method. The first successful heavy cargo parachute drop was completed at Wright-Patterson AFB in 1948 when a 2,200-lb field gun was dropped.

The problem of air dropping a bulldozer into one of the top air projects was solved by Wright Air Development Center and it also proved one of Army's highest priorities.

## Master Rod Bearing Failed in Cairo Crash

A Civil Aeronautics Board report on TWA World Airlines' Constellation crash, which crashed on June 3, 1949, blames the accident on failure of the new master rod bearing of No. 5 engine during climb to altitude, and consequent loss in the right wing.

The report, which was issued last week after the first crash, said the No. 5 engine falling off 100 ft below the point of impact. The aircraft struck the ground in a relatively flat position with the right wing a little low and in a slightly nose-down attitude. Gear and flap were retracted.

No. 5 propeller was almost completely feathered, the emergency fuel shut-off valve to No. 3 engine was found in the closed position, and the No. 5 engine located near the ditch had been inspected.

Since TWA and other R-1150B1 engine operators had experienced a number of master rod bearing failures, the board recommended that all pilots and flight engineers to be certified that for the immediate inspection of such failures—high oil temperature accompanied by low oil pressure.

Whereas such engine oil pressure, the report says, the engine should be feathered immediately.

Corrective measures taken by a result of this accident and previous master rod bearing failures were:

- CR 1 changed every 400 hr instead of newly being replaced between engine failures.
- TWA's engine testing fire crash oil samples to keep maintenance out of the engine.
- Engine master rod bearing fluid tubes have been installed by TWA as a means for rapid installation of a new master rod bearing plug.
- Constellation's engine oil level is an independent overboard to replace fluid from oil.
- TWA discontinued oil dilution.

## Airline Merger Reports Increase

But despite more favorable atmosphere at CAB for consolidations, other factors make action soon unlikely.

Merger among domestic airlines once again are coming in for increased attention. The Civil Aeronautics Board is known to be strongly in favor of encouraging the consolidation of a number of air carriers in order to make the industry more self-sufficient without benefit of mail subsidies. And pressure is in and out of that airport have advanced various proposals which would reduce the number of airlines.

In a significant reversal, CAB recently allowed Western Air Lines to retain certain profits from the sale of the Los Angeles airport south extension. The reason for the switch, according to the Board, is to encourage voluntary route re-alignments.

Among other things, CAB declared "management of the national air system has been for some time, and still is, a primary objective of the Board."

In order to avoid the danger of considering the present air picture to a rigid mold, and to continue to encourage voluntary action by the carriers, we believe that the acquisition of profits which may be derived from the sale of a route... should be permitted here."

Long-Range Plan.—This statement may well be heard by the carriers as an incentive to study in progress for some time designed to realize the airline's future plan. This pattern is expected to be refined in the next future.

Despite the desirability of strengthening the airline network through mergers, and the profound desire of CAB and industry to accomplish this objective, it remains highly unlikely that any major consolidations will be effected for some time to come.

The postal authorities surrounding certified airline line simply is not conducive to voluntary mergers. The free play of economic forces is not permitted to operate in the regulated air transport industry. There is no real incentive to negotiate desirable consolidations as long as a carrier has the right to expect sufficient mail pay, under stated conditions, in the past, present, and future markets while.

► No Compulsory Power.—CAB just does not have the power to compel airlines to merge. It can, however, prod in both official and unofficial action. Control over the award of mail compensation is a powerful weapon in this respect but the Board has been most

reluctant to apply it in this manner.

Moreover, at present all of the airlines, with one exception, are operating highly profitable operations. This supports a strong case for maintaining the status quo of the individual carriers by their separate managements.

The natural pressure for merger must come during periods of financial stress.

In the regulated industry it has not been insurance for strong units to acquire weak companies which could not weather the financial storm. But in the unregulated airline industry, mergers and combinations remain suspended. Hordes of potential criticisms of public convenience and security, as long as they have the right to mail pay, can expect to remain in business. It was this factor which prevented a number of merged airlines to survive the difficult postwar readjustment period.

Only if CAB applies pressure through a reduction in mail pay can there be a real motivating force operating for merger and consolidation among the major or secondary airlines. The recently exposed CAB objective of a two-level structure within the industry composed of economically self-sufficient trunk lines and of local service carriers, can hardly be attained without rigid control of the mail pay system.

► No Easy Road.—Even if voluntary mergers were proposed, they would be beset by tough stalling. The airline merger path is a most arduous one, beset by many obstacles. Many have tried, but only a few carrier mergers have a bona fide merger been consummated since commercial aviation came into its own with enactment of the Civil Aeronautics Act of 1938.

For the trunk line holding permanent certificates, the hurdles have been steep and complex in attempting to effect some desirable consolidations. Physical assets are not difficult to appraise. But placing a price on a "line-clear" is a most intricate and many a proposal collapsed in the attempt.

Strong personalities of airline chiefs have also clouded in the shadows on who was to become head man in any merger. And when some agreement was at the top level is accomplished, opponents must obtain the sanction of the separate boards of directors and

after that, appeal from stockholders. Dividend groups can place any compromise plan in jeopardy.

The biggest obstacle remains in obtaining CAB approval. Board approval is required of any consolidation design, lease, operating contract or acquisition of control of any certificated carrier. The Board must find that such proposed arrangement is in the public interest before it can become effective. The low desire the Board not to approve any arrangement which would result in creating a monopoly or guarantee monopoly or even set a policy to the agreement.

It is the threat of suspending the operation of "another air carrier" which can prove particularly troublesome.

► PAA-AMA Example.—A recent example of some of the problems involved is present in the case history of Pan American's acquisition of American Overseas Airlines. This proposal was first launched in December 1948, and was precluded upon a quick, favorable decision. Instead, extensive negotiations ensued and it was almost two years before this suggestion was approved.

Precedents established in the course of previous merger attempts (distrust of the formidable obstacles in the path of airlines attempting to combine. After approval by a special CAA committee, the Authority (the Board's predecessor) in 1946 denied United Air Lines' application to acquire Western Air Lines. Main reason given was that the size and control of United would adversely affect the competitive situation in that area.

American Airlines attempted to acquire Mid-Continent Airlines through an exchange of stock. This proposal was turned down by the Board in 1946 on the grounds that it would merely add to American's burden and, further, that an uncertainty of present status existed between the carriers.

► What Is "Desirable"—In recent years, the CAB has expressed encouragement of "desirable" mergers. No specific considerations have been suggested in the past. Fortunately, the "desirable" mergers will be revealed in the forthcoming Board recommendations for a regulated airline stock structure.

This is still very near the constructive process of scaling well in advance of any formal proceeding the proposed Delta-Northeast merger, a combination of two carriers which do not now connect and which is viewed as a safe refuge to give additional mileage and an entry into New York for Delta. Discussion recently held concerning a Northwest-Northern, along with other mergers and combinations, could conceivably take them out from the forthcoming CAB suggested stock pattern revisions. —Belf Abelson

## Martin Speeds Plans for B-57 Production

Conversion standards well along; first plane due late in 1952.

By Irving Stano

Baltimore—Two key airplane characteristics—simplicity and performance—prompted the Air Force to buy the English Electric Co., Ltd.'s Canberra bomber, which the Glenn L. Martin Co. will build here as the B-57A.

Our own planes aren't lacking in performance, but they carry a load of government-specified or furnished equipment and gadgets that in addition to being weight and in the configuration, give a highly complex craft open loads and maintenance work.

And the designers of the Canberras by the Air Force, may find, the large wing of a new design and proven concept for military craft—new from the point of view in this country, but not new for the British.

All of the foregoing is the substance of the report. Martin officials do not agree with the above interpretation. They say the Canberra purchase does not start a trend, but rather that no new planes are not readily comparable and that the Air Force's decision to buy the Canberras was based on the plane's range and maneuverability and the need for a light bomber.

► Simplicity Evident.—Looking at the English Electric Canberra, it is at once apparent that the plane is the quintessence of simplicity—a delicate and subtle simplicity clearly indicating that the British design had built a military plane on the basis that it is a weapon of war, and as such it is possible. Progressing from the firm's basic theory the plane's heart is a super-simplified, only four "components." While this demands a new set of plans for the ground crew and operational complements, it does make the latter crew expendable in a sense.

In the Canberras, for example, there are no duplicate emergency systems, whereas our military planes for safety reasons add complication by introducing duplication (sometimes triplicate) of systems.

And in general, other reports, the Canberras' simplicity is evident. ► To eliminate weight and cost of adding extra, belts are pinned over plane mesh on structures when data-

## Photographic Three-View . . .



CANBERRA B. MK. 2

Length	65 ft 8 in*	Overall, lower panel	3 deg.
Span	65 ft 11 in	upper panel	4 deg. 21 min
Height	15 ft 7 in	Maximum tail	111 in
Wing root chord	10 ft	area, gross	27 ft 4 in
Wing tip chord	7 ft 2 in	empty	10 deg
Wing area (gross)	960 sq ft	Vertical tail	71 sq ft
Aspect ratio	4.4	area, gross	10 deg
Thin/thick chord	17 percent	Leading edge	17 ft 5 in
Thin/thick root to	6 percent	tail	
Gross panel sweep	13 deg 31 min		
TA, swept/panel	19 deg 53 min		

\* With 100 lbs weight still in stability engine at maximum 100 lb



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- **Bomb bay doors** are being with two spray loaded gun at the end of each panel.
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- **Wood shoring strips** are used wherever possible.
- **Tangos** tubes are used throughout to eliminate cable problems.
- **There are no sub-assemblies** or de-coupling systems.

• **To minimize penetration**, the inside surface of the base metal is painted with a synthetic rubber coating composed for a "bag" effect, in contrast to filling the joints with lead solder.

Martin's designers and production engineers approve the Cadmus's simplicity and, as far as possible, will carry it over to the B-77A. (Generally speaking, every "improvement" added to a plane can cost a great deal of extra complexity, additional weight, decreased performance, and poorer handling characteristics.)

• **Role Changed**—At the B-77A, the Cadmus's role will be changed. Ever since, engineering, which started back in August of '45, the Cadmus was completed, except for some miscellaneous equipment, in July '48, and first flew in May '49. The prototype was intended to be a high-altitude reconnaissance bomber. The production version (B-77A) came out as a medium-altitude bomber. There is some talk in the plane but it doesn't depend on this primarily.

There is a crew of 3-pilot, navigator and bombardier, the latter two seated side-by-side aft of the pilot. English Electric has built no more than about two dozen of the plane to date.

Martin will now forward the B-77A version, but as an Aerospace Industrial aircraft it will step into the role of a night-strike bomber, with crew of 3-pilot and navigator-bombardier.

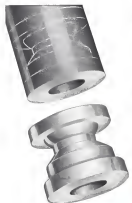
How many of the B-77A Martin will build has not been announced, but a guess may be brooded from the company's published backlog figures. As of the end of February, backlog was 3,537 million. Martin received an order of \$100 million in June, the published backlog had soared to more than \$400 million indicating a substantial quantity of B-77A.

• **Change Name**—The plane won't be built in Martin's Middle River facility but in one of the U.S. government plants used by the company in World War II.

Martin will adhere closely to the basic scheme of the Cadmus in order to produce pretty much the "same beast" but some changes will have to be made in the B-77.

• **To equip the plane** for night-strike service it will be fitted with gauged and fluid breather for guns (Cadmus has no guns) for clearing apertures

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EXTENSIVE SUBCONTRACTING on B-57 is indicated by components in black—representing about 60 percent of plane's weight.



FINE LINES of Canberran nose enclose 5-ton coils. Bombardier gets forward, push.



TIPS on tail move with control surfaces. B-57 tailcoat will house brake shoes.

ground trugs, and these will also be some electronic equipment changes for the night aspher detector.

• For operations into small and slippery runways, the B-57 will carry a tailhooked brake chute.

• Bomb bay will be redesign to accommodate a larger number of bombs—smaller than those created by the British in the B.M.2.

• Cockpit lighting will be redesign for night flying. Standard A.N. cockpit illumination will be used. Martin had a hand in developing this system and the first cockpit glass in which it was used was the AM-1 Mustang.

• The Canberran's Rolls-Royce Avon has known, while the B-57 will fuel on JP-3, and this will mean changes in the fuel system. Bag type (Mussel) rubber cells will be used instead of the integral tank scheme in the Canberran, vents will have to be larger to accommodate the vapor from the more volatile JP-3, and fuel lines will have to be enlarged in order to prevent vapor lock.

• A section of skin on the Canberran's aft fuselage top is hand raised in a bag bag's panel. This procedure points up a fundamental difference in the production techniques of the two countries—Robins relies on the artists, we rely on the machine. Martin will take this long stretch of skin, now too large for its automatic riveter, and break it down into shorter pieces so that the machine can accommodate it thereby stopping up man production. This will mean redesign of some structural details and, accordingly, will mean a little mass weight.



CARTRIDGE for starting screw into nose of engine.



DIVE BRAKES are bag-type, loaded on top and bottom wing surfaces.

• The Canberran wing has a single spar support (loading and trailing edges have ribs again located at about 40 percent chord). This leads us to a large hogged-out fitting (90 x 54 x 7 in.) that serves as the fuselage curve through structure. Fabrication time for this unit is considerable. It will require a larger hanging fixture capacity than is available here, and the unit eventually will be redesigned, but meanwhile the British hog-out procedure will have to be followed.

• More Weight. More Thrust—As a result of these changes, together with the increased torque of the B-57 for greater range and heavier engines, the Martin cost may grow about 15 percent more than the Canberran. This increase in gross weight will not compromise the performance, because of the increased thrust of the B-57 engines. Selection of these powerplants has not been announced. But they probably will be the J-65 Supracat (Aviation Week, May 7).

Though Martin's contract for the B-57 stems from the Air Force, the project will be administered under Navy engineers. The company concluded licensing agreements with English Electric in May, with the proviso that drawings were to be received in June. To date, about 50 percent of the drawings and approvals have been received from England.

Martin had a team of engineers and production personnel at English Electric in April for about a month. Two permanent men are there now and English Electric has a resident customer here and one of the original ground



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crew of the first Canberra delivered (see news item below).

Martin will receive certain parts from English Electric.

These parts will be used only if American requirements cannot be immediately obtained, so the production schedule will not be delayed. Some English parts possibly will be used for the first six or seven B-57s, where equivalent substitutions would be under very critical presentation.

For the remainder of the production run, American equipment will be selected to duplicate exactly the Canberra's installations—this because the plane will have to be built according to a test schedule and be supported from the U.S.

Conversion Big Task—Martin already is well under way on the project. The tremendous redesign job probably is the major factor behind an engineering standpoint. Production men, company technicians don't anticipate any great problems, feeling that the B-57 will be a fairly straightforward task.

About 200 engineers are already engaged. Some are working on equivalent standards, some on new design work for these changes already known, and others are engaged in stress analysis. The engineering crew will think to about 150 by late fall and will hold them for about a month. This will be the peak, and will then taper down to about 90 engineers for maintenance problems.

A national for equivalent standards is now being prepared and will show the British part and its American counterpart side-by-side for guidance of engineering differences and Martin's part changing activity.

In all substitutions for the British standards, Martin will use existing A-N parts, wherever possible, without decreasing strength or increasing weight. Where direct substitution is not feasible, Martin will design new standards.

Standards Conversion—The trouble from English standards will be no easy job—a piece by piece task. The British use different sheet gauges, rivets, bolts and screws, and the test compression will have to be determined for each case. The ultimate result of Martin's work on this conversion phase will point the way to a set of standards to be used in this country for work on other British craft, should they come along.

The British-type shock rivet is but one little example of what problems Martin will face. The unit has a dual lever head than the shock rivet used here and allows installation with machine counterdrinking as the first step instead of the way we can use with our rivet. We would have to duplicate a more complicated and expensive procedure. Therefore, to obtain the same approxi-



ANNOUNCES...

# Micropulse

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Three views of the American bomber

## Trans-Atlantic Teamwork

The twin-jet Corsairs, being groomed to tolerate our nuclear air power, is a working example of British-American cooperation. Originally designed in England as a high-altitude nuclear bomber, its flight test proved it to be as effective at low-level operations. Now, a light bomber version of this light jet bomber will be added to our own Air Force, built by Martin under license from English Electric Co., Ltd.

The Korean conflict has re-emphasized the importance of tactical air power at low-level support of ground troops. To this mission, the Corsair brings exceptional maneuverability at high overhead speeds, and at low levels and low speeds... ability to whip around like a fighter and turn with the best of modern aeronic... ability to carry a potent, destructive payload.

**Martin**  
AIRCRAFT

Building Republic's aircraft since 1945

The Glenn L. Martin Company, Baltimore 3, Md.

tion) soon page on the Martins. Martin has developed a new standard—the first will have the same head brought in by British units. Tests have already been run to establish the real ability of the new sort.

► **Work Plan:** Martin's get ready, and work schedule.

► **Release of new material:** quantities and purchased equipment will cover a period of about six months for the first lot of planes.

► **Engineering release of drawings:** will take about 21 weeks (36 weeks from start of preliminary engineering—based on standard equivalent decision time).

► **Receipt of material:** cover about six months and will run to about December for the first lot of planes.

► **Fabrication completion of detail (production) tooling:** will start about six months. This will be for all planes.

► **Fabrication of first lot of detail parts:** will start about six months, and will start the second.

► **Assembly tooling for bench, rigging and final operations:** will start about eight months—will be for static and flight articles.

Except for release of new material quantities, purchased equipment, and engineering drawings, the time periods will run concurrently.

The static test phase is scheduled for completion by late January of 1952. The static proving should require about two months to assess clearance for the flight article, which will follow closely. The static tests will continue to prove test specifications stress and design data, but the phase of the static testing will be independent of the flight schedule since it does not relate to aerodynamic characteristics.

The first few planes probably will assemble an experimental aircraft as would normally be built between large subcontractors. As the program progresses, these large units will be broken down into smaller units for high production. This is because the English job initially will be followed either closely to present present making and performance. As the first few planes prove out, changes will probably be made to accommodate the shift in better production—if it can be done without that these changes will not lower flight performance.

► **Subcontracting:** Estimated—about 60 percent (by weight) of the aircraft will be subcontracted. Martin will build the main fuselage (nose and center section), the main wing (main through structure), and will do the final assembly.

About for major subcontractors will fabricate the other main substructure components—wing, nacelle, aft fuselage, empennage, and bomb bay door. Also subcontracted will be the nose cap,

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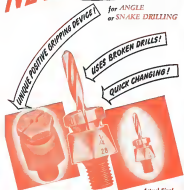
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plut's exclusive, more and more used with, by tanks, forgings and castings, hydraulic cylinders and valves, electrical actuators, action seats, etc.

Subcontracted work will be made complete, with all the projects that go into them. The subcontractors will do their own British conversion tasks and any redesign necessary, but under Martin's supervision, as well as design and manufacture the production tools for the parts.

Martin's subcontracting program will be concluded this month, officially. Sales will be passed for proximity to Martin's manufacturing site, the tool's facilities and how long have. Some undoubtedly will be in the subcontractive field. Some new facilities also are being considered because of their short rental experience and equipment, but will be selected only if they will do their own tooling.

► Tooling. Equipment—The B-57 will require complete new plant tooling. Some will be obtained from government surplus, some from the machine tool industry. Cost available will run over \$10 million. The tool will be standard aircraft work, because the structure has unusual shapes which does not require special steps.

The tooling program (machine tool) was not up at the beginning of February, actually before the contract was signed. Tools are being shipped in and stored now.

Production workers are being hired now for the B-57 project. Some are engaged in creation of machine, proving out machines after their long storage period, and other miscellaneous tool.

Martin's total factory employment is now 3,500, and by May of next year will climb to about 11,000. Meanwhile the 3,000 increase will be absorbed off other contract work that terminates and will be transferred to the B-57 project.

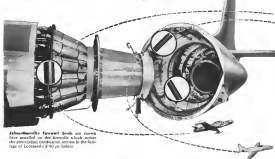
The production floor on the B-57 now runs as high as 5,000, more than half of which will be on fabrication, depending upon state of plane output.

Some manufacturing of B-57 parts—engine shop and sheet metal operations—will be done in the present Martin plant facilities. But this will be a very small portion of the work and will be fitted in where machine capacities are available and where the lead factor will permit taking on additional jobs. All other work to be done by Martin on the plane will be in the new plant facility if not required.

About 25,000 production (sheet) tools will be required—coming from a 2-in. template to a 28 x 12 x 17.6-in. bushing under section assembly fabric.

Production changes from British technique will be made internally.

## New fire-safety for even the "hottest" jets...



John-Manville Firewall Seals are shown here installed on the firewalls which isolate the compressor combustion gases in the fan-lip of Lockheed's F-100 jet turbo.

## with these Johns-Manville FIREWALL SEALS



In most a variety of requirements, Johns-Manville Firewall Seals are available in 7 styles, with 2 types of cores (1) as bonded core most suitable for sealing firewalls in the turbine flame area and other high temperature areas, and (2) a synthetic rubber core for sealing firewalls forward of the combustion chambers.

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Johns-Manville Firewall Seals are made in a number of styles that adapt them to virtually any firewall sealing requirement. They are constructed with a pocket of heat-resistant asbestos cloth coated with flameproof Neoprene. This pocket encloses a core of Inconel mesh or synthetic rubber tubing. The bonded mesh core acts, for the higher temperature areas, have successfully run in a 2000°F flame penetration test for 36 minutes.

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where they do not involve engineering changes, so as not to slow production schedules. Changes that will involve engineering changes will be made progressively in later models. Motors plant know now what many of these changes are, but will have to wait for an appropriate time for consideration.

Out of these hundreds of changes that would normally be considered profitable, perhaps only half will be made to obtain the necessity of building another static test plane (within the scope of the present contract).

Optical Tooling—Morton is favorable considering the use of optical tooling for alignment of the bridge center section and probably will recommend optics to the subcontractors for the purpose of reducing the use of the master gages or eliminating them where possible. Use of optical tooling by the rats would supply the coordination of parts they build that rats with Morton fabricated components.

Morton will have its company representatives at each major subcontractor to guide it in the manufacturing process, to ensure that the work will conform to Morton's own standards. And its technicians will come to Morton for initial consultation.

Since the B 57 will be the first production jet aircraft that Morton is building, the repair men later will be considerable in the plastic case of all the line. The plan is to construct a number (up to production rate) of portable devices enclosing a windshield arrangement with buffer and wind absorption materials, to reduce the speed of the jet exhaust, yet eliminate back pressure on the engine.

Hot Spray Finish  
Douglas Aircraft Co. is going to experiment on using 274 hours in finishing AD-4 Sparanet with a hot-spray lacquer. Booth team alone has been out 6 hours, using present crew and equipment.

According to a report received by Hercules Powder Co., maker of the microcast equivalents from which lacquers are made, one coat of hot lacquer gives the required film thickness where two coats of finish were previously needed. This eliminates sand blasting and the danger of sanding through the finish on rivet heads and skin lips. And the hot spray technique gives a saving per plane of 2 gal. of lacquer and 5 gal. of thinner.

Hercules reports that tests have demonstrated better flow-out for flat material, less tendency to sag, bleed or orange peel and a smoother, glossier appearance. Superior characteristics were exhibited in salt spray and weatherometer tests.

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FINISHED FUEL TANK is culmination of much research by Vie Petrofin Industries



KUSPER BAG—the main die in Domstar process—hangs over all sections of 218-gal fuel tank being fired into Molokite die



LID IS LOCKED (see machine at right) and bag expanded by 600 psi. Fuel present to form jettisonable tank post

## Expanding Rubber Forms Parts

New technique uses unique male die to force metal into complex contours for jettisonable fuel tanks.

By Thomas L. Sell

Giving birth to a new manufacturing method can sometimes be painful. It can also be rewarding in the end.

A case in point is Vie Petrofin Industries, Inc. of Los Angeles, and its development of a technique for forming metal to complex contours by an internal expanding rubber die.

At considerable trouble the Petrofin company developed from conventional processes to develop this method of hydraulic drawing. In making for and off sections of jettisonable fuel tanks for military aircraft.

But now, the company declares, production of the new process saves 75 percent of fabrication costs over the old.

The Petrofin company held a prime

USAF contract for over 5,000 jettisonable tanks for fighter planes, and it wanted a method of metal forming that would be less expensive and quicker than usual methods.

►CME Wynn-Edwards fuel tanks can be formed by hydro-pneumatics, using the rubber pad process, or by rolling. These were rejected. Spinning a metal work-up technique quickly accepted as being the cheapest method for fewer than 5,000 parts, was also rejected as too slow and expensive.

Charles Domstar, tooling engineer, evaluated all the choices and decided on hydraulic drawing, using rubber, as the most efficient and economical way of doing the job. He felt he could design a relatively inexpensive piece of equipment that could lower the cost



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board action of the droppable tools quickly and easily in a single operation. The metal would be stretched from center to cylinder into straight, cone-shaped shape.

The expanding mechanism consists of a 4-in. thick rubber bag of neoprene rubber, holding 40 gallons of fluid. Normal operating pressure is now 400 psi, but the bag will withstand 1,000 psi, if required. The die holder is a Modulus casting weighing 1,500 lb., with 24 in. wall thickness, and designed for over 1,500 psi. The male die is blind in and out of the female die by an overhead cable, riding on pulleys, and with a counterweight at the other end. A high-pressure pump transfers fluid from the rubber die to the counterweight reservoir and back again through a relief valve set at 600 psi. Power is generated by a 24-hp 15-gpm motor. Fluid may be passed in either direction by reversing the motor.

The Operation—The Modulus die holder is set to allow clearance of 4 inch over the net size of the part to be formed. A wood pattern is then bolted to the size of the finished part, covered with plastic releasing material, and supported inside the Modulus casting cavity. Plastic pieces are secured into the space between the casting and the pattern. The die then is lowered in a tank of water and kept at the boiling point for 60 min. to cure the plastic. It is allowed to cool in the water before being withdrawn. By means of this simple plastic bag, the die is made to the exact size, shape and surface desired. The dies likewise switches on parts from forming. Different configurations may be formed as the same dies merely by changing the plastic bag.

Finally, here is how the process works. You take a sheet of 0.05 gauge 350 aluminum alloy sheet, cut it to the flat pattern and roll into a cone or cylinder. Then you Helium atom weld it. At this point parts still have straight-line marks.

Then you put the cone into the die. The rubber forming die, as bag is low and on its side until it fits snugly in the short metal cone. A small ball, 7 1/2 in. thick and stressed for a 200-ton load actually holds the rubber forming die in place. Fluid is pumped into the bag from a reservoir until 400 psi. Pressure has been attained. Expanding rubber will stretch-form the straight-sided cone into a curved cone configuration. At this point the pressure is suddenly released. The part has been formed to the desired shape and surface. At the same time it has been given a flat section parallel to the axial plane, where the tank will be joined to the wing of the aircraft.

After the liquid has been pumped out,  
(Continued on p. 30)

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# MICRO Precision Switches chosen as safety limits on new Glenn L. Martin "404" passenger liner!



Martin 404 passenger liner

MICRO's new Type 1A enclosed switches are small, lightweight and sealed to operate under severe dirt, dust, ice or immersion conditions.

The MICRO 2LA1 precision switch shown at the right is designed to assure the user for a completely sealed limit switch housing, with a rotary type actuator, for use in a wide variety of aircraft applications. The switching unit within the sealed housing are two AN224-1 (MICRO Catalog Listing V341) single-pole, double-throw switches. The two switch units are operated *exactly* simultaneously when the external rotary actuating shaft is moved in either direction. The lever arm is adjustable through 360° to 36 positive lock positions in increments of 10 degrees.

The MICRO Type 1A is also available with plunger type actuator (MICRO Catalog Listing 1LA1) which is similarly sealed and also provided with a scraper ring to prevent ice from damaging the "O" type seal rings.

MICRO has a complete line of precision snap action switches which conform to military specifications MIL-S-6785 and MIL-S-6794, and many switches designed to conform to Joint Army-Navy Specifications JAN-S-63. Write for Catalog No. 72.



MICRO units on landing gear scissors lock reverse propeller pitch while ship is in flight; also lock landing gear in "down" position until ship is airborne.



MICRO 2LA1 precision switch located on nose landing gear scissors

Two unique features of MICRO 2LA1 precision snap-action switches influenced their selection by engineers of the Glenn L. Martin Company to perform those important functions in the new 404 liner.

The 2LA1 switch is mechanically linked to the landing gear scissors insuring positive operation in both directions. The switch is completely sealed by use of "O" rings within the housing, eliminating the use of rubber or synthetic boots. Thus, this ruggedly constructed switch gives precise, dependable performance under extreme conditions of shock, dirt, dust, ice, splash and immersion.

Many other new special switches for aircraft are on the drawing boards and in the experimental stages at MICRO SWITCH. Sales engineers are located at MICRO SWITCH branch offices to cooperate with you in the development of the switch to meet your most rigid specifications.



Closeup of MICRO 2LA1 installation showing the direct mechanical linkage by which the lever arm is driven in two directions to operate and release the switch

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(Continued from p. 54)  
the de lid is unrolled and the bag lifted out.

Developmental Problems—Numerous problems confronted Deament in building the equipment. No rubber bag of the desired specifications was on the market, so rubber was purchased and the bag built in the Fairbanks plant. The saving of 68 thou natural black rubber was required to undergo an elongation of over 400 percent because of the developmental nature of the casing, it was not possible to buy it synthetic.

A mortared rubber bladder had to be formed in one piece without a seam. It was also impossible to buy this. The part was made in the Fairbanks shops by spraying a form for 24 hours continuously with natural latex to generate a completely contained part with join walls, using the lost wax process.

Early parts made from 6061 gauge 180 aluminum alloy sheet were wrinkled like an accordion when lowered. One of the big problems—and present efforts—is how to stabilize the skin being formed to prevent release failure.

Another problem that needed solution for a long time was how to seal the double rubber of the casing at the point of entry as an area where pressure exceeds 100 psi.

Though the Deament process was designed especially for the production of kerosene and all varieties of petroleum fuels, the process may be used to stretch from other parts which require the stretching of metal from straight line shapes such as cones and cylinders into forms with tapered contours in one operation. This includes the process which may be necessary for an involvement of baskets, fuel lines and belts. The process is particularly well adapted to the fabrication of tanks, cradles, and spacers. It is adaptable to steel as well as aluminum.

Parachutes built these ways:  
• Time: The new action of the tank can be spun in 15 to 20 sec. for each part under conditions of maximum efficiency. To make the same part by the Deament process requires a little less than 3 min. for each part, and no designing is required. A part that has been Deamented requires only a wipe with a rag to be entirely clean.  
• Cost: The use of the Deament process results in a saving of 75 percent in fabrication costs over spinning.

• Other Advantages: Sections formed by the Deament process require only one longitudinal seam weld. Other methods using stamped tanks require two seam welds.

The expanding process gives high uniformity of skin gauge after forming. Spinning, because it is a hand operation, results in skin thickness variations.

## A CARLOAD OF COMFORT for men who ground-test jets



Here is another big Maxim Shelter ready to roll to the West Coast. Just as the one below is doing at the Lockheed plant in Burbank, this shelter will be used to eliminate the rain during jet run-up tests, so that the health and hearing of technicians can be protected during final adjustments and testing of the engine. Maxim is proud to have a part in making easier one of the great tests undertaken by the aircraft industry today.



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ADEL MANUFACTURING CO.  
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## OUR EXPANDING INDUSTRY

Coswin's new Gated Matrix division is establishing an engineering research and employment base in downtown Pomona, Calif., occupying about 15,000 sq. ft. The engineering areas will handle magnetics pending construction of a plant on a 140-acre site in Southern Pomona.

Beck Aircraft Corp. has had production of its new USAF T-16 two-engine trainer assigned to Wichita. Air Force has awarded the company an official order for a substantial quantity.

North American Aviation, Inc., has signed a five-year lease with the City of Irvine, Calif., for larger and expanding training facilities at Irvine, California, covering approximately 150,000 sq. ft. The lease provides an option for additional 50,000 sq. ft. of space if needed later. NAA will supply about 300 at Irvine.

Atlas Helicopters is increasing building space at Palo Alto, Calif., from 35,000 to 110,000 sq. ft., including a new two-story administration and engineering building, separate mail building and paint shop building and an extension of the firm's present plant.

Treco Engineering & Mfg. Co., Del. has just received an additional subcontract for Douglas A-10 Skyhawk order systems, having a dollar value nearly equal to that of previously announced A-10 work taken on by Treco. This second also includes contracts from Boeing-Wichita calling for fabrication assembly and installation of equipment in the A-10 rear fuselage sections Treco is making for Boeing. It has received a 2,900-ton fire hydrant pump from 16 military facilities contract granted it by Navy.

Northrop Aircraft, Inc., plans to build a branch facility on an 80-acre site at Anaheim, Calif., to produce optical stage systems for Army tanks. Factory will eventually employ 1,500 and occupy about 250,000 sq. ft. Company is expanding its Hawthorne, Calif., aircraft manufacturing facilities 10 percent, incorporating an additional 450,000 sq. ft. and costing some \$5.3 million.

Kaiser Aircraft Corp., Wichita, Kan., has leased 12 additional buildings to speed up production of engines for Navy. New facilities are another building complex by Kaiser to 18 and new floor space from 42,000 to about 100,000 sq. ft.

Boeing Motor division of General Motors plans to build a three large plant, near Flint, Mich., to produce parts and subassemblies of the Wright J-57 Suprajet turbine.

Solar Aircraft Co., San Diego, Calif., has expanded production so that it has expanded into aircraft design—among the new units being a research products division to have manufacturing and sales responsibilities in three Solar lines, the first department, Sales and Marketing department, and standard stock inventory.

Lawrence Aerospace Co., Dallas, Tex., has secured additional contracts for Corbin 18 elevator subassembly, which will require 300-320 more employees. Currently, Lawrence employs about 450.

Ross Aircraftcraft Co., San Diego, Calif., has received a \$1 million order for jet engine components from Westinghouse Electric Corp., involving work with new, highly heat-treated, stainless steel alloys. Ross has also been given a \$250,000 order from General Electric Corp. engine systems to be used on Convair-Learjet 240s and 360s.

Lockheed Aircraft Corp., Burbank, Calif., is expanding a facilities plant at Beverly Hills to build Super Constellation wing and tail sections. Employee count is expected to reach some 100 at the 60,000 sq. ft. building, now used by the company as a warehouse.

Douglas Aircraft Co. has purchased four acres of land and 57,000 sq. ft. of buildings from Southern California Homes, Inc., at Bell, Calif., for use as an aircraft maintenance and assembly aviation maintenance plant. Price of the properties was \$250,000 and includes one of the largest heated bonding spaces in the country. Employment there is expected to reach 400-500.

Cross Aircraft Co., Wichita, Kan., has started over 50 facilities in sub-ventured units from Lockheed for sub-construction and assembly of F-94 and T-33 components and all fuselage sections.

Kaiser-Framm Engines Division's Downer, Mich., plant is to be used for output of components for Wright R-1380 aircraft engines for the USAF. These parts will find the half-million square foot Detroit plant, purchased from Continental Corp., for expansion by the North American T-28 trainer.

McGraw-Hill, Inc., Los Angeles, Calif., is expanding facilities some 50,000 sq. ft. to process various metal forms and parts for aircraft.

Fitch Aircraft Division's 57 mil. line expansion program at Hagerstown, Md., is well underway. A new production line will increase passenger seats by 15,000 sq. ft., bringing total production floor space to approximately 500,000 sq. ft.

Republic Aviation Corp., Farmingdale, L. I., N. Y., plans new construction to cost approximately \$1.5 million including making in and build-up of a 40,000 sq. ft. area between the past plant and last shop wing, construction of a state-of-the-art laboratory and modification of an aircraft hangar to take fuselage equipment.

Seeger Helicopters Co., Evanston, Ill., has been given a multi-million dollar contract by North American Aviation to build vertical and horizontal stabilizers for the F-66B Silver in production at Los Angeles, Calif., and Columbus, Ohio.

Wellman House & Almonson Co., Cleveland, Ohio, is spending \$250,000 to expand its program mainly with new manufacturing facilities, adding about 50 percent to present capacity. The new facilities will be located in a 15,000 sq. ft. plant being leased by Wellman.

Boeing Aviation Corp. has agreed to purchase the South Mountain Manufacturing Co., So. Mountain, Pa., and will operate the 102,000 sq. ft. organization as a new division. Up to 700 workers will be employed at this location. Boeing has also agreed to purchase the Union, N. Y., plant of Continental Can Co., consisting of 225,000 sq. ft. of floor space on a 12-acre tract, and expects to ultimately employ 2,000 people there.

Bell-Jock Scientific Instrument Co. is negotiating with the government to build a 100,000 sq. ft. defense plant at Riverside, Calif., to produce electrostatically controlled analog computers and its instruments.

Electron, Carlson & Co., 1400 Reed Ave., Rockland, Ill., is entering into a building of machinery and tools for aircraft production. The firm is offering its V-84 and V-100 model arm blast-resistant for working on plywood, plastics and non-ferrous metals.

Flint Control Co., Anderson, Ind., is doubling its floor space devoted to making jet engine controls, with construction to be completed by July 1 about 100 employees will be needed.



## Highest Scorers in the World's Toughest Game win with ADEL

Time and again, the world's leading aircraft manufacturers have scored with ADEL products in meeting the most exacting requirements of both civil and military aircraft. Since the beginning of World War II, ADEL has worked closely with aircraft manufacturers to develop and manufacture hydraulic control equipment improving the industry's most exacting standards. Today, ADEL is interested in progress of advanced research in aircraft hydraulics, and in solving the many problems born of the new developments in military aviation. ADEL offers the world's most complete line of aircraft hydraulic control equipment, including a full complement of hydraulic fluid boosters and anti-suck connectors, clips and hose supports, PLUS an engineering service which ensures that solutions to problems are of the most critical hydraulic problems.

Whatever the nature of your problem in aircraft hydraulics, we'll get you to call an ADEL, Best ADEL, ADEL, DIVISION, CENTRAL NUTS & BOLTS CORPORATION, 2075 Van Owen Street, Burbank, California.



## EQUIPMENT

## Airlines Expand Automatic Pilot Program

Most planes on order to have autopilots plus approach control units

Descending to more gay and no maximum work week, 557 Bonds and Sperry automatic pilots are going to take much of the strain from air transport operations of the world's leading airlines, he says.

And the two big manufacturers are hotly contesting who shall sell the airlines the most and best robot pilots. The score so far on the domestic and Canadian confirmed airliner autopilot programs: Boeing for 168 planes, Sperry for 242. On the foreign side, Boeing is ahead with 129 planes programmed vs. Sperry's 93.

► **Current Totals**—Right now, the toll cuts to 370 domestic and Canadian sicknesses and 187 foreign visitors with automatic pilot installations already operating or programmed.

Of the total 557 U. S. and foreign airlines already scheduled for automatic flight, 296 either have already as will have automatically approach control.

Radar-beam approach control took up with the autopilot: "Down the plane right on the beam and close to the runway threshold to land," it does that by monitoring off-course radar signals into an automatic corrective action by the autopilot. The human pilot is not left out. He becomes more valuable than ever. He's relieved of the day/night part of his job. He needs much mental stress, too. So he can monitor his instruments and visual flight ever efficiently than ever.

And any time he doesn't trust his robot assistant, he can overpower it on the controls quite easily. Or easier still, he can switch off the robot's electric power.

★**The Big Two Donations**—The two largest domestic airlines have ordered complete fleet installations as a zero-maintenance approach complete for their customers.

United Air Lines has two Bendix approach systems in and 62 on order for their 44 DC-6s, 20 DC-6Bs and 40 Convair 340s. American Airlines plans to install the Sperry auto approach in all its DC-6s and DC-6Bs.

United purchased one of automatic pilots with approach control when it installed Sperry A12 gyroscopes on DC-4s back in 1946-47. UAL's gang is for the Bendix PR-11 on the DC-6.

### Auto Pilot & Approach Installation Programs

[illegible]

Source: Edgar Pinner, Dr. Fisher's donation on July 19. Henry Synnott Co. on July 19.

but has decided to put A-17s on the 40 Convair-Lear 360s it has on order. American starts installing Searcy A-17

geoplots that fall in DC-60 as the eastern foot of Suen is pulled off the line one by one during a southward ex-

“For Maximum Power, Economy  
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## American Airlines Specifies

DEPENDABLE

## CHAMPION

## SPARK PLUGS



Airline pilots know that the ability to get maximum engine power at a given moment is the greatest single safety factor they have. That's why 96% of the airlines fly with dependable *Champion*®



"AMERICAN AIRLINES requires spark plugs that give maximum power, economy and dependability. That's why American Airlines uses dependable Champion Spark Plugs for our fleet." (Quoted: M. G. BEARD, Chief Engineer, American Airlines)

Add to the CHAIRMAN'S BOX: CH

(Steve Wilkos's) Not another messy Friday night, says the still sober

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## DROP TANKS Always DROP

When released by  
WIGGINS breakaway couplings

Air, decisions must be transferred into instant action without fear of failure. WIGGINS couplings insure positive sealing under full pressure range and in all vibration conditions.

Illustrated Right—Cross section of Wiggins automatic coupling which releases tanks on 8-478, B-36, B-52, B-42, B-42 and F-4V. Available in double or single self-sealing models. In shapes to meet installation requirements.

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SCREW PRODUCTS COMPANY, INC.  
33 GREENE STREET NEW YORK 13, N. Y.

work program. Every DC-6 will eventually get Sperry's automatic approach control outfit, as the program goes forward. Next year, American's autopilot and approach unit will be the largest operation of its kind.

American plans both automatic pilot and approach control in its new, big jet DC-8s and freighter DC-7s. American's first to lower weather minimums once flight crews have outgrown their mechanical fears. FLM.

## Ultra-Sonic Solder Bath Aids Tinning

(McGraw-Hill World News)

A new ultra-sonic soldering bath for tinning small and complex-shaped aluminum parts has recently been introduced by Mullard Ltd. (now name for Mullard Electronic Products, Ltd.), Chesham House, Sharnbury Ave., London, W. O. 2. The soldering bath acts as a complementary tool to an ultra-sonic soldering iron developed by the same firm.

The device consists of a small soldering bath 2 in. in diameter and 2 in. deep, heated by a conventional resist wire winding. Tack is that the molten solder is agitated by a superfrequency transducer which produces ultrasonic frequencies.

Features of the ultrasonic vibration is to break up highly refractory oxide films which normally form with rare or costly metals such as aluminum. The manufacturer claims that this is a much more satisfactory method than their formerly used acid methods in positive, uniform joints with a minimum of etching.



## AIRPLANE SWINGER

The Type B-1 Wakefield aircraft convertible (Western Work, Apr. '6) has been installed at eight Naval Air Stations throughout the country and is being put in at Alameda and Los Alamitos NAS to simplify aircraft conversion. The B-1 has a diameter of 57 ft., a capacity for 5000 tons and loads of 10,000 lb. The Wakefield Engineering Co. of Concord, Mass., also makes a Type B-2 convertible with a 64-ft. diameter and 100,000-lb. capacity. One is being installed at the Glen L. Martin Co.'s Middle River plant. Another, as one at Fairchild in one two years, has not required one minute of maintenance in that time, according to Wakefield.



## ANOTHER CONVAIR "FIRST"

The USAF T-29, the navigational trainer version of the world-famed Corsair-Lear, is selling off the production line in steadily increasing numbers.

The T-29 "Flying Classroom" is the only plane in the U. S. Air Force that gives in-flight training to 14 students at one time, furnishing each with a full complement of radar and navigational equipment. Records show that the Corsair T-29 is turning out more and better-trained navigator-handlers in less time than ever before in air training history!

The T-29 is another "first" in a long line of famous Convaircraft and is proving again the top airplane design and production organization at Convair.

IN THE AIR—IT'S  
**CONVAIR**

GENERAL DATED FULTON  
AIRCRAFT CORPORATION

FORT WORTH, TEXAS  
SAN DIEGO, CALIFORNIA



**C-122 AVITRUC  
POWER PACKAGE  
PRODUCED BY ROHR FOR  
CHASE AIRCRAFT CO., INC.**

**THIS IS A POWER PACKAGE BUILT BY**

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**WORLD'S LARGEST PRODUCER  
OF READY-TO-INSTALL  
POWER PACKAGES  
FOR AIRPLANES**



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fan. No flux is required and soft solders may be employed.  
The unit will operate from 100-280 v., 40-60 cycle current and consumes 200 watts max.  
Enclosures are: soldering, left—6 x 6 x 9 1/2 in. Weight—4 lb. Supply unit—9 x 18 x 12 in. Weight—40 lb.  
Midland is marketing the soldering unit in the U.S. and other foreign countries.

**Gulf Makes New  
'All-Temperature' Oil**

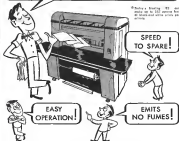
A new, "all-temperature" oil, specifically developed for aircraft equipment operating under wide ranges of low pressure and altitude, is being offered by the Gulf Oil Corp.  
Designated Gulfair Oil 6, the lubricant operating limits are -50° to +210°. Gulf says the oil's outstanding characteristics are high viscosity index, low viscosity and low pour point.  
Typical applications are: those in engine, auxiliary, landing gear, hydraulic, gear, and other instruments, photo copiers, ammeters and electronic equipment, flexible drives, air friction bearings and bearings, and hydraulic power transmitters.  
The oil has excellent anti-corrosion and anti-oxidation qualities.



**TEST CELL FIREFIGHTER**

Two of the three newly installed carbon dioxide discharge units guarding the sensitive motor of engine run up in the American World Airways engine test cells may be seen in above (above). They are connected to 16 10-lb. CO<sub>2</sub> cylinders arranged in two units of eight cylinders each. One set will cool one and two (in center). Mounted without discharge the gas is used of fire to protect engine and test cell from damage. For re-equipping equipment was supplied by Walter Kable & Co., Beltsville, Md. J

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**Outpace your present black-and-white print equipment!  
Meet today's Brunning—it makes other machines look slightly  
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**TAKE ABOUT VOLUME!** with a Model 90 Brunning you can print up to 100 square feet per minute! And that's finished prints—prints that come out flat, dry, neatly stacked and ready for immediate use.

**TAKE ABOUT EASY OPERATION!** since Brunning BW machines are so simple and need no focus, they require no special exhaust installation. You merely connect them to your electrical circuit and you're ready to make prints. And before a Brunning machine is rolling, all you do is set the desired speed and feed in the paper. That's all. No trained operator is needed.

**TAKE ABOUT EASY MAINTENANCE!** all essential bearings are permanently lubricated—no oil or grease. The adjustable

speed drive is a patented, stepless transmission that runs for years without attention. Parts that do require occasional attention are accessible in minutes.

**TAKE ABOUT FLEXIBILITY!** Brunning BW machines can handle any black-and-white print job, and we different models offer a complete range of speeds and capacities. Too, there are 33 varieties of Brunning standard papers. Black and white—far more than any other manufacturer offers.

**SEE FOR YOURSELF!** the speed and ease of operating a Brunning BW machine. It's an eye-opening view of what present equipment is just when you're old. A complimentary demonstration, or our explanatory booklet, is yours for clipping the coupon.



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### V-Band Couplings Save Cost, Time on T-40 Turbo Prop Engine



## ENGINEERS' NOTEBOOK



İstanbul Kültür Sanat Akademisi (İKSAA) (2013)

**Coupling Simplifies Attachment of Jet Engine Tail Pipe**

A Maiman V-Band Coupling is used to join the tail pipes to the tail cone on the I-47 Eagle Pulling strongest requirements, it must maintain a tight seal at all times and provide a structural connection capable of carrying heavy loads under high temperatures. Quark connecting Maiman V-Band Couplings achieve significant weight, cost and time.

**Save cost and design time With Marman  
Standard Clamps for Special Applications**

FOR INFORMATION, WRITE: 22PM  
**MARMAN**  
PRODUCTS CO. INC.  
940 W FLORENCE AVENUE  
INGLEWOOD, CALIFORNIA

## NEW AVIATION PRODUCTS

### Motor Valve

A versatile, motorized gate roller (invented) is the latest addition to the "log" line of automotive controls developed by General Controls Co.

The motor valve, designated model AV 35, includes quick change feature to facilitate maintenance and is offered in a variety of operating versions to meet your particular requirements. The unit, handling both gas and liquid, is made to meet all applicable military specifications. These points are highlighted by the maker.

- One-piece valve body minimizes possibility of leakage
- Motor and actuator assembly can be removed without disturbing valve as installed in system
- Motor can be replaced quickly by manually operated handle, a special assembly equipped with bearings to carry cable rigging loads
- Motor assembly with integral manual override also can be used in place of turbine motor installation

With this latter attachment, the valve can be opened or closed both by motor or by hand. The manual over-ride provides complete disconnection between the motor and the manual operator, giving complete freedom for either operation. Address: General Controls Co., 551 Allen Ave., Glendale, Calif.



### Hydraulic Power Unit

A compact, portable hydraulic power unit which can be rolled around the production line or taken right up to the asset for hydraulic component or system checks is being produced by Sanyo Farm Service & Sales.

The equipment provides pressures from 500 to 7000 psi and has flow—about one gpm. at 2000 psi. It can be used for operational or proof testing of various hydraulic components or



of gears is a matter of fitting competent men and efficient machines to the job. One machine may be used to make a variety of gears, but the quality of some types it produces might suffer... or the cost might be higher.

4. Here at H&B FOODS... in our own plant... we have an assortment of gear-making machines each of which is used to make gears with certain specifications. This enables us to turn out a volume of gears while positively controlling quality and price. Our highly skilled workers subscribe to and uphold the H&B FOODS creed: "No one shares our responsibility."

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for operational or static testing of complete hydraulic systems in aircraft. Operation has been simplified, according to the maker.

Design is aimed to fit needs of manufacturers of small and large aircraft, makers of hydraulic components, airlines and service installations. Challenge not self-contained about this unit is that it depends on an outside source of compressed air to operate its air-powered hydraulic boost pump. The set normally creates operating with a 25 ft. air hose. Also included are a reserve (free-gal. capacity), 15-lb. hydraulic hose, pressure regulator, shut-off valve, relief valve, four-way selector valve and other accessory accessories and controls. The heater is provided

with a single or dual outlet system. Address: Spangco Engineering & Sales, 1744 W. 135 St., Glendale, Calif.



### Navigation Radio

A VHF communication and naviga-

tion radio set, dubbed the Avogadro, Jr., and proved to fit perfectionists of private flier is being marketed by Mitchell Industries, Midwest Wells, Texas.

The set includes a two-channel, VHF transmitter. This is equipped with two standard crystals, 172.1 mc. for range stations and 112.5 mc. for tower. Other frequencies can be added without removing the set from the plane. Output of the transmitter is two watts. For an option, a tunable VHF receiver with remote control is provided. Output with headphones is 300 milliwatts, while with loudspeaker, it is four watts.

The set is available with or without emergency equipment. The photo shows an auto indicator mounted on the equipment. Without extra, the set is priced at \$187.21, including tax.



### 'Liliput' Bearings

What may appear to be a radial split and some marbles in the picture above, is a miniature diamond's precision ground and the smallest pivot ball bearings made in this country.

That's the claim of Monette Precision Bearings, Inc., the manufacturer. The bearings—its small size to normal sizes—they are almost out of sight—should meet the approval of any conscientious engineer as evidenced.

The tiny bearings have an outside diameter of 1.5 mm. Tolerances are held to plus and minus .0002 in., with machining measurements accurate to .000025 in. Balls are held in place by the pivot shaft and the necessary roll is designed to prevent mass action at points of greatest stress. This permits bearings to handle relatively heavy loads under severe conditions of shock and vibration, as encountered in aircraft maintenance. The company's address is Kew-Forest, N. Y.

### New Fuel Pump

A fuel pump originally induced to meet fuel system needs of the Boeing B-47 has been placed on the shop-

UP THERE WITH THE BIG NAMES, CHAPTER NO. 5



## BRANIFF Airliners safer than ever—with SKYDROL

Braniff International Airways always is alert for advancements that mean greater safety and comfort for its passengers. That is why the Braniff DC-4 Airliners, that ply the airways of the Americas on a five-mile-a-minute pace, have Monsanto Skydrol in their cabin superchargers.

Skydrol, Monsanto's fire-resistant-type hydraulic fluid, chooses for the possibility of fire due to hydraulic line failures while planes are in flight or when being serviced. Thus, Skydrol protects passengers, employees and the multimillion-dollar investment in aircraft. Skydrol, a long-lasting fluid of high viscosity, also brings important savings in maintenance costs.

If you are interested in a water-hydraulic fluid that is efficient under all normal

flight conditions, investigate Monsanto Skydrol. Write for technical information and a copy of the booklet, "More Safety in the Air with Monsanto Skydrol." MONSANTO CHEMICAL COMPANY, Corporate Chemical Division, 1500 South Second Street, St. Louis 8, Missouri.

### ADVANTAGES OF MONSANTO SKYDROL

SKYDROL is fire-resistant—exceeds the nonflammability requirements of American Society Specification 3110.

SKYDROL is a general purpose lubricant. In most critical cases, viscosity more than double that of other hydraulic fluids.

SKYDROL is stable at required operating temperatures and pressures.

SKYDROL is comparable to aircraft engine oil.

SKYDROL is water-resistant—does not require special handling or protective coating.

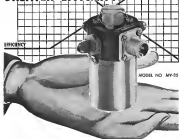
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WEIGHT • FUEL

## LIGHTER WEIGHT plus GREATER EFFICIENCY

EFFICIENCY



MODEL NO. MV-25

## ...MAROTTA VALVES

Through continuous engineering efforts, the weight and size of Marotta valves are constantly being reduced. At the same time, efficiency is being increased. For the lighter, smaller, and most efficient valves available, specify...Marotta Valves.

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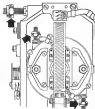
*Marotta Engineering Company*  
SODDINGTON, NEW JERSEY

## Fastener Problem of the Month

JULY, 1991



**PROBLEM:** When engineers at Lear, Incorporated, Grand Rapids, Mich., were designing the toply-securing aircraft Airframe, the balancing of the pin mechanism presented some difficulties. In this sensitive instrument, positioning of gas-spring elements required fine accuracy and positive adjustment. Initially, this problem was solved by the use of weights held in place first and set by pin nuts. But adjustment of these weights was difficult, because the slightest change in position required loosening both nuts and changing them up again in the new position.



(Actual size)



SINIA 7798 M

**PRECISE POSITIONING** of instrument assemblies or surfaces bolted together by single structural members are among the many fastening problems solved with equal ease by Elastic Stop Nuts. If you have a problem involving exact adjustment and fine pins, call us at your BSA company, or write Elastic Stop Nut Corporation of America, 2330 Marshall Road, Oxnard, N. J.

metal carrier by the Roscoe division of Lear, Inc., Elkhart, Ohio.

The pump, Model BG-9020, is designed to activate all fuel from the start-to-stop after a rotating or fuel transfer operation has been accomplished. It is designed to deliver at least 100 gph with a discharge pressure of 3 psi at 17,000 ft altitude when rated at 3,500 rpm by a 2 1/2 in. d.c. motor. It has a capacity of 150 gph when equipped with a 1 1/2 in. d.c., 4000 rpm motor operating at 1000 rpm and 3 psi pressure. Thus equipped, it is designated Model BG-9040.

Featuring explosion-proof design and equipped with a roller meter filter, meter and pump are suitable for operation at extreme temperatures, dry. Roscoe Pump is self-priming and no lubrication is required other than ball grease. It can run dry for short periods. Pump is positive displacement, rotary vane type and weighs 3.25 lb. with motor.



### Pipeline Couplers

New "Quick-Lok" coupler for joining pipelines might be used to advantage by the military to help speed the setting up of pipelines at remote outposts in advanced areas.

Tests show one man, using these couplers, can lay about one-half mile of pipe in an hour, according to the maker, H. M. Wade & Co. Described as a simple device in industrial pipe line handling, they are said to be useful wherever liquids, air or gases are conveyed in pipes—and especially where speed and portability are major factors.

Couplers are made of aluminum alloy, are designed to withstand pressures up to 300 psi. They permit pipes to be connected or disconnected without tools. Another addition advantage is that they are built for use on standard pipe. Special "lock-in" gaskets are designed to ensure positive sealing and are supplied with or without a self-draining feature, depending on requirements. The couplers come one of the features of coupler used with portable irrigation equipment. These letters have been produced for a number of years by the Mechanical Press Works, manufacturing division of Wade. Address: H. M. Wade & Co., 106 St. Louisville Ave., Portland, Oregon.

## MONEL

A general-purpose, corrosion-resisting alloy for applications that require a hard, tough, high-strength material

Monel® is a solid-solution alloy which combines high strength, ductility, fatigue strength, and toughness, with excellent resistance to corrosion. Its properties can be changed by cold working but it cannot be age-hardened. It is slightly magnetic at room temperature and is non-magnetic above 110°-190° F.

The principal mechanical properties of Monel are:

- **Tensile Properties:** Hot-rolled Monel has a minimum yield strength (0.2% offset) of 15,000 psi, a minimum tensile strength of 70,000 psi., with an elongation (in 2 in.) of approximately 40%.

### SHEAR STRENGTH OF MONEL RIVET WIRE

Temperature of Test, °F.	Soft Process	Hot Process
From	41,500	54,500
150	41,500	54,500
200	41,500	54,500
300	41,500	54,500
400	41,500	54,500
500	41,500	54,500
600	41,500	54,500
700	41,500	54,500
800	41,500	54,500
900	41,500	54,500
1000	41,500	54,500
1100	41,500	54,500
1200	41,500	54,500
1300	41,500	54,500
1400	41,500	54,500
1500	41,500	54,500
1600	41,500	54,500
1700	41,500	54,500
1800	41,500	54,500
1900	41,500	54,500

- **Toughness:** Due to the combination of high ductility and high strength, Monel is one of the toughest alloys.

Heavy triplet valves work down 220 ft.-th. for hot-rolled Monel, to 180 ft.-th. for cold-drawn.

- **Spring Properties:** Monel spring wire can be used under corrosive conditions and at temperatures up to 450° F. For wire sizes between that 0.007-in. diameter, design of springs is based on a tensile modulus of 9,380,000 psi. and stresses of 40,000 psi. for average service, and 35,000 psi. for severe service.

- **Endurance Limit:** In rotating beam tests of polished specimens at room temperature and 30,000 p.p.m., Monel (cold-drawn, annealed) showed an endurance limit for 10<sup>7</sup> cycles of 42,000-47,750 psi.

- **Low-Temperature Properties:** Monel has excellent properties at sub-zero temperatures. Data shows that strength increases, without appreciable change in ductility, hardness or elongation strength. Cold-drawn Monel at -110° F. had a tensile strength of 117,000 psi., a yield strength of (0.19% offset) of 108,000 psi., and Charpy impact strength of 378 ft.-lb.

- **Working Characteristics:** Monel can be forged in practically any shape forgable in steel. Recommended temperatures for hot-chamber forging and drop forging is 2100° to 2500° F. Hot working should be avoided in the range of 1700° to 2200° F. (If it is unavoidable, only light hot work should be done.) Monel behaves similarly to mild steel in mechanical cold working, as in rolling, drawing, coining, die-forging, power hammering, bending and forming. Monel's high strength limits manual operations, such as spinning, bending, and hand hammering, to very severe Heavy work can be done by hand only with frequent anneals. Monel is satisfactorily machinable but due to its toughness, cutting speeds are somewhat slower and feeds lighter than those for mild steels. It can be joined by the usual welding, brazing, and soldering processes.

- **Corrosion Resistance:** Monel is highly resistant to attack by most commonly encountered corrosives, including oxidizing and alkaline salts, salt water, mineral acids, alkalies, organic acids and hydrocarbons, and wet and dry gases.

- **Forms Produced:** Monel is supplied in most commonly used mill forms—rods, forgings, squares, rounds, flats, strip, sheet, seamless tubing, wire, welding materials—and in a variety of finishes and conditions. It is also produced as acid, centrifugal and precision casting.

### FOR ADDITIONAL DATA

Write for your free copy of Technical Bulletin T-2, "Engineering Properties of Monel and 'N' Monel," or request an optional engineering introduction to these alloys.

For help on specific metal problems, write directly to Inco's Technical Service, outlining your problem.

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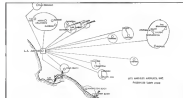


## AIR TRANSPORT

### LAA Readies Passenger Copter Service



DOWNTOWN HELIPORT eventually will be focus of LAA passenger service. But first...



AIRLIFT SERVICE will be added between certain points and airports. In next phase...



MAIL ROUTES now being opened will also be given passenger service to L. A. airport.

First U. S. operation of its kind likely to start next summer.

In one of its most far-reaching decisions to date, Civil Aeronautics Board has authorized Los Angeles Airways, parent owner of mail and cargo by copter, to start passenger service on a 50-mile radius of metropolitan Los Angeles, and beyond to San Bernardino.

The decision paves the way for a new era in American air transport—scheduled copter service in competition with automobiles and buses and sometimes trains in crowded metropolitan areas. Other copter operations can be expected to begin the scramble for strategic look-alikes soon. Chicago's Helicopter Air Service, now carrying only mail and cargo, may be next to start passenger service. New York Airways, awaiting CAB certification "someday," is eager to get started, although it will probably have to limit its work to mail and cargo service only, at least the other.

**Passenger Potential**—The potential seems to exist. According to CAB studies, more than 62 percent of future air traffic involves in the country will be generated within the so-called under-500-mile range. Half of all passenger travel lies less than 400 miles.

To narrow the field specifically to the possibilities of the LAA operation, consider the number of air passengers per week originating from just one of Los Angeles Airways' proposed passenger service stations, Pasadena, to the International Air Terminal at Los Angeles. A check showed that in the case of service current alone, 775 passengers come in from Pasadena. At present, these passengers have to undertake approximately 45 minutes of surface travel through congested Los Angeles to the International Airport. LAA can get them there in 30 to 45 min.

It was also found that 160 reservations were sold in two months as the issue of Riverside for departures on arrival from the airport terminal.

Los Angeles County's Department of Aviation has been quick to realize the potential. It has revised its master plan of airports for the Los Angeles County metropolitan area and replaced many of the planned airports with heliport locations.

Estimates CAB won't let LAA President Clarence M. Belton fly pro-





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SECTION 3

## NORTH AMERICAN AVIATION, INC.

Los Angeles International Airport  
Los Angeles 45, Calif.  
Columbus 16, Ohio

ment terminal building, and exten-  
sion of aircraft roads, parking areas and  
storage facilities will cost \$12 million.

2. Both north-south runways would  
be extended to 10,000 ft. and across  
road widened to four lanes. This plus  
additional minor improvements are set  
at \$5 million cost.

3. East-west runway would be wid-  
ened from 150 to 200 ft. and all run-  
ways would be widened to 150 ft. Ad-  
dition to terminal and maintenance  
building and additional parking and  
utilities improvement would be pro-  
vided with a total cost estimated at \$7  
million.

Land cost, it is estimated, will be  
around \$200 an acre to the 77 parcels  
residing on the fully suburban site.  
Major job of leveling the land will be  
an earth removing and filling one. A  
screen of trees is expected to be estab-  
lished around the boundaries of the  
field in an effort to make the airport a  
"good neighbor." CAA officials said.

First phase of the airport plan is de-  
signed to take care of demand 1955-  
1960 on traffic in the Washington area.  
It is probable that the bulk of long-  
haul air traffic will be transferred to the  
new airport, due for completion (Phase I)  
in the spring of 1975. Washington  
National Airport will continue to handle  
short haul traffic.

## SHORTLINES

► **Air India International**—Flow 12,327  
passenger last year, plan \$13,000. In  
total cost \$75,000, 10 cargo. Lane col-  
lects first birthday last month.

► **Allegheny Airways**—Crestair a cre-  
dited day's load for any local service ap-  
proach—1,537 passengers carried July 8.  
Day's load factor averaged 65 percent.

► **Canadian Pacific Airlines**—Is negoti-  
ating sale of its three Canadian routes  
operating to the United and Australia.  
New CPA fleet will be two de Havilland  
jet Comets and three Douglas DC-6Bs.

► **Continental Air Lines**—Came in for a  
windfall during the ten day United Air  
Lines strike, flying 50 extra sorties be-  
tween June 19 and June 25, carrying  
1,015 passengers. Eleven extra flights were  
by Convair-Lear 240 and 39 were  
Douglas DC-3s.

► **Northeast Airlines**—CAA has ap-  
proved Northeast Eastern contract for  
Eastern to lease DC-10 and seven this  
summer to help fund Washington-New  
York traffic. One proviso: they can't  
advertise flights as through-stop, plus

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Engineering Personnel Manager

PIASECKI HELICOPTER CORP.

MORTON, PA.  
A Philadelphia Suburb  
NEAR SWARTZMORE

most stand a half hour in New York  
before going elsewhere.

► **Pan American World Airways**—First  
year of 1960 service from New York  
to Buenos Aires topped at 258 flights car-  
rying 23,152 revenue passengers (1,718/  
96) passenger miles without an acci-  
dent. "Contrary to previous reports from  
one of the carrier's offices, mishap re-  
ports between New York and Caracas  
(Aviation Week July 16, p. 77) which  
are included in current schedules filed  
with CAA cannot become effective un-  
less approved by the Venezuelan govern-  
ment." Discussions between the two  
countries are now underway.

► **Shuck Airways**—More than doubled  
last year the first half of the year over  
last. Ten million last half 1970 over  
15 million, compared with 15 million a  
year ago. June ton miles 5.5 million  
compared with 3 million a year ago.

► **Southern Airways**—Local service air-  
line flew almost three times as many  
passengers this June as last. June, 1970  
passengers on numbered 5,809, com-  
pared with 3,214 a year ago. Southern  
serves 31 cities in the south—12 ex-  
clusively.

► **Trans World Airlines**—Starts service  
to Kansas City Airport serving King  
man, Kansas City and Eastport,  
N. Y. Sept. 20. TWA serves 60 other  
cities in the U.S. and 20 more abroad.  
This expanded Frank C. Hahn's  
ownership of regional airlines, A. E.  
Jordan manager of overhaul at TWA's  
maintenance and overhaul base at Ken-  
sas City.

► **United Air Lines**—Flow 577,919,000  
revenue passenger miles the first half  
of this year, up 24 percent over 1969.  
Expenses two million up 41 percent to  
5,734,000, and up 40 percent to 8,580,  
000, and freight down 5 percent to  
11,649,000 ton miles. June traffic was  
cut sharply by ten-day plane strike, 127/  
145,000 passenger miles this June are  
20 percent over a year ago. June  
load was down three percent and  
pass 41 percent for the same reason.  
And compared to July of this year June  
passenger miles dropped 21 percent  
and ton miles 40 percent and cargo 43  
percent.

► **Western Air Lines**—First half-year was  
a record financial success. Estimated  
net profit to have \$800,000 or \$1.15 a  
share. Second quarter alone netted  
\$435,000 or 85 cents. First half of last  
year netted only \$385,173, 1970 second  
quarter net profit was \$325,517. First-  
half operating revenue this year at  
\$8,390,000 in 25 percent over last year.  
Operating expenses were up only 11  
percent to \$6,808,800.

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SATURATE WIRE—the world's  
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climate good, new 100, 100, 100, 100, 100, 100,  
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has all the best features, NARCO has  
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## COCKPIT VIEWPOINT

By Capt. R. C. Rafter



### All-Weather Flight and Outdated Thinking

(This is the last of three parts in a series on All-Weather Flight.)

All-Weather flying should be commonplace by now. The long sought goal of aviation can be achieved with available facilities if some changes are made in outdated thinking.

At present, bad weather forecasts are controlled by CAA's system of "metcons." This policy establishes maximum ceilings and visibilities for each airport. Determination of these factors is the job of the United States Weather Bureau. When observations indicate that the weather is better than CAA standards or those as shown below on last airport altitude.

Obviously, the entire theory of weather means hinges on the accuracy of the USWB observations. How accurate are they?

► **Reports vs. Accuracy**—Best information on the accuracy is found in the reports on a series of "Annual Weather Law Caching Flights" by Sperry Gyroscopic Co. By plotting USWB reports against actual observations made from a cockpit at the same station a mathematical analysis of the accuracy of ground observations was made. Some Sperry quotes:

"In a reported ceiling of 200 feet it is almost a certainty (at the probability is 95) that the vertical visibility height observed during any given approach will occur within the limits of 50 feet and 450 feet." (This for day approaches.)

"In a reported ceiling of 150 feet the actual vertical ceiling height observed during any given approach will occur between the limits of 100 and 300 feet. In the probable case of a USWB ceiling reported as zero the vertical ceiling height observed during any given approach can be expected to occur within the limits of 100 and 300 feet." (At night.)

"Night visibility observations do not measure vertical ceiling height as seen by the eyes."

► **Misleading No Help**—"It is clear that the reported weather does not enable flight crews to predict, within reasonable limits, the altitude at which either vertical or threshold visibility will be obtained. The pilot cannot predict within reasonable limits where transition will begin. This is particularly true during day operations. This limitation of current weather observation methods has been independently observed by the Landing Aids Experiment Station at Austin, California and by Mr. S. S. Calvert and his associates at Pensacola, England.

"In view of this limitation the crew must make its own observations during each approach and assess the weather and transition. Vertical ceiling height would be the actual assessment and is the beginning of transition to visual flight."

It is obvious from these measurements that the CAA weather system policy has no excuse for existence.

► **New Theory**—A more usable approach is one that has been taken by the Flight Technical Group of the International Air Transport Association (IATA), composed of top-notch pilots and operations area of leading airlines. Their theory is currently being studied by ICAO.

The new thinking eliminates weather criteria and establishes a "critical altitude" based mainly on aircraft performance and terrain. The program calls for the establishment of an altitude for each type of aircraft at each airport below which the plane cannot safely execute a "go-around."

Regardless of the "official" (ground checked) weather a plane may let down to this critical altitude where the pilot must determine if a safe, steady landing can be made. If the answer is negative a pull out is begun.

The critical altitude concept, based on what the aircraft can do safely, under various conditions of terrain and equipment, appears more sensible

## WHAT'S NEW

### New Books

**High Noon**, by Frank J. Taylor, is the story of United Air Lines, during the course of which the author tells a good deal of the story of the early days of U.S. air transportation.

It is a tale that has been told before, but it still retains its fascination to Mr. Taylor's version. In addition, this book has an unexpected interest in that Mr. Taylor goes into some detail on United's employee relations and employee policy—which became top news almost concurrently with publication when UAL pilots went out on strike.

Two incidents in particular related by Mr. Taylor furnish a backdrop to United's current operations. In 1942, UAL's President W. A. Patterson and the Air Line Pilot Ass'n President David L. Beahm clashed over a new contract. A deadlock ensued and a pilot representative privately asked Patterson to yield "and not be a hero's farm," in a phrase for which the UAL pilots would say to it that the words did not take advantage of the concession.

"Well, how about my hero?" demanded Patterson.

"Mr. Patterson, who had been listening, spoke up. Why not get out of this business and enjoy some peace of mind?"

Patterson actually decided to do that, the next day, and the famous pilots talked him out of it.

Many years ago, at the time of the 40 cent convention, most of the major airlines shut down either five pile up issues when they had no real pay money in a United continued to operate, even though it cost the line more than \$1 million. According to Mr. Taylor, the line was Patterson's who said, "Our pilots and our general crews have to eat."

This is our opportunity to show our people they are in a stable business."

Publisher is McGraw-Hill Book Co., 1221 W. 42 St., New York 35. Price is \$4.00.

### Telling the Market

Aircraft, an improvement for magistrates, although, however, because and other men having contacts in departments in Technical Bulletin 291, which also notes some advantages of the ready-made improvement over long and tedious manual methods. Write Alvin Edwards-McDonald, Inc., 600 Broadway, New York, 20, N.Y. 10038, 110 St., Cleveland 2, Ohio.

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(Illustrations courtesy of Koppers Propeller Co., Inc.)

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## Rails & Fares

Raising fares and cutting passenger service continues to be the order of business by Eastern railroads. The Pennsylvania wants to eliminate 46 passenger trains on July 1, including The General, fastest New York-Chicago all-Pennsylvan train. (Pennsylvan raised fares 15 percent June 1.)

New York Central is studying elimination of unprofitable trains. It recently merged the Poughkeepsie and Advance Commuters VandeBilt between New York and Chicago. (Advance just started hourly commuter flights on this run.)

Major railroads in the North asked ICC for a 30-percent increase in passenger fares. They would raise coach rates from 2.5 cents a mile to 2.75 cents, and Pullman fares from 3.5 cents to 3.85 cents. And ICC told Eastern railroads to go ahead and file for a 15-percent readjustment discount in coaches instead of 24 percent, as it passed, and 5 percent on Pullmans instead of 10 percent.

Meanwhile, the Long Island admitted (see *Spies*) that a "considerable number" of commuters have stopped using the railroad since it raised commuter fares 25 percent last April.

We hope the scheduled airlines, already profitably above their break-even points, read all this if they are tempted to raise or hire.

## The Collision Threat

Two railroad collisions splattered across the newspaper front pages a few days after *Airman* What's worried editorially on Apr. 23 of an increasing likelihood of such accidents. These have been two others more recently, involving military aircraft.

Obviously, the timing of the April editorial was sheer coincidence. But, unless there is some kind of concerted and coordinated action by all aviation interests—commercial, private and military—an increase in collisions will not be sheer coincidence.

*Airman* What's comments on the subject are not pleasant. Nor do we enjoy being a purveyor of calamity. But the subject needs the most serious attention.

There are not enough rules of justice to cover the most important potential causes of collisions. Too many of the presently existing rules are being ignored and violated. There are too many loopholes in current regulations. There is a difference in interpretation of various rules and practices.

The collision problem is all its ramifications would be a suitable study for someone in finance, provided the report carried with it sound recommendations to decrease that threat.

Must we wait the inevitable accidents before we act? The worst are those that could have been prevented.

## Organize or Hang?

The scrappy Air Coach Transport Assn., like its Government members, has fought a stout fight for the unscheduled passenger carrier. The odds against it would have been called overwhelming several months ago.

The government's Civil Aeronautics Board was well embarked on a legislation program for the unscheduled, and such so busy about it. The scheduled air mail carriers were wadding hefty blows to Capitol Hill—which had been displaying only a mild, polite interest in the non-scheduled low fare carrier.

Yet ACTA President Anne Henscock kept pounding away, submitting suggestions for adequate funds—some of them his own. Henscock has never been a diplomat but even those few members of Congress he called admitted he had a case.

The association has won a court injunction to stop the CAB's "death sentence," and it has won a warmly sympathetic report from the House Small Business Committee, at a time when this Administration is known to be intent on the small business man. ACTA has also been winning increasing attention from the press. The New York Times considered the Committee's report front page news.

These are important achievements. But the association's backlog of work yet to be done is big if the controls set to win legal redress to stop on the scene and become a permanent agent of air transportation.

This is no time for the various carriers to disband and go again their haphazard ways, forgetting once more about cooperation and the self-policing that has cut but still not eliminated the public's complaints about non-scheduled service.

The accidents have a future, we think, but only if they fight for it. Let them take as an object lesson the unfortunate abandonment by the local service carriers of their own Feder Airline Assn. some years ago before these then hard-core lines had solved some of their most important problems. We believe the lack of a strong association devoted exclusively to the local airlines' own interests has been a serious handicap ever since FAA was permitted to fall apart.

There is some sentiment among the so-called independent lines for a strong association comprising the better non-scheduled carrying lines. This group would comprise two subdivisions—the passenger and the cargo lines, including the presently certificated air freight companies who also operate without government payments.

The idea is sound. The advantages to the carriers of this combined strength are self-evident. It's a project that should be studied seriously. What was that Benjamin Franklin said about hanging together or hanging separately?

—Robert H. Wood

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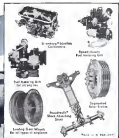
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**when speeds  
go up... up... up...**

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the two gears and a locating bearing diameter run true to one thousandth of an inch, the gear teeth profiles must have accuracy measurable in millionths. It is one of the many gears manufactured by Foote Bros. for use in Pratt & Whitney engines.

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